



DEPARTMENT OF PREMIER AND CABINET
NEW SOUTH WALES

CABINET STANDING COMMITTEE ON INFRASTRUCTURE

DECISION PAPER

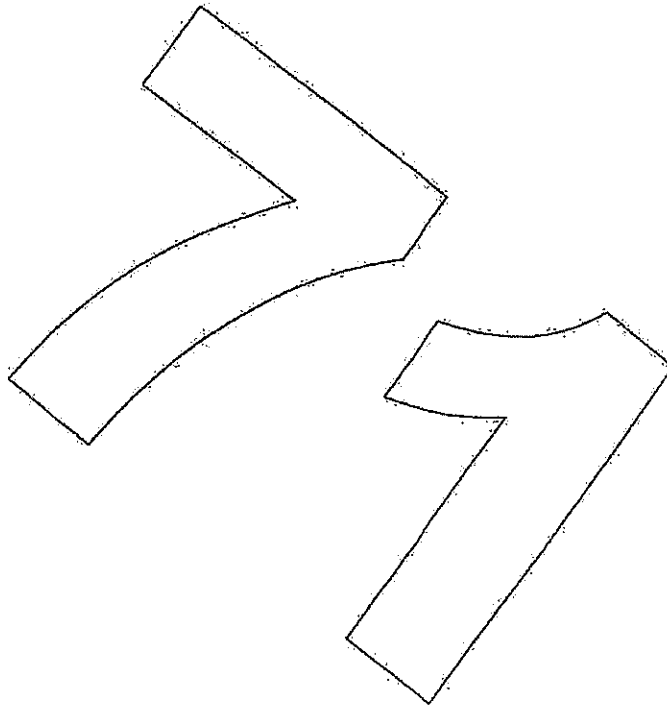
Wednesday 11 December 2013

ITEM 10: Newcastle Revitalisation Project (SC577-2013)

The Committee:

- 10.1 Endorsed the location for truncating the heavy rail line at Wickham to reconnect the city centre to the foreshore and to support future implementation of light rail.
- 10.2 Agreed that further work will be undertaken by UrbanGrowth NSW, Transport for NSW and the Department of Planning and Infrastructure for report back to the CIC in February 2014 on the following:
 - business cases for two route options (one in the heavy rail corridor and one along Hunter Street);
 - development of urban renewal options (and estimation of their contribution to project benefit calculations); and
 - recommendations on optimal project delivery governance.
- 10.3 Agreed that the Minister for Planning and the Minister for Transport will coordinate a public announcement by the end of 2013 to keep the Hunter community informed of progress with the project. This should refer to route and urban renewal options under investigation and their indicative high level construction timetables.
- 10.4 Noted that further amendments to the Newcastle Local Environmental Plan to support catalyst sites will be re-exhibited in early 2014.
- 10.5 Noted that the final Urban Renewal Strategy will be released once the city centre light rail alignment has been confirmed.
- 10.6 Noted that the proposed light rail solution is the first stage of a future light rail system; ongoing work is occurring to plan a potential wider light rail network linking the CBD with surrounding suburbs, key destinations

and the broader Hunter region; and that two potential routes are emerging for future consideration: a route from Wickham down south to the Junction and a route to the west to link the Hunter Stadium.



NEW SOUTH WALES – CONFIDENTIAL CABINET MINUTE
SC577-2013

Title	Newcastle Revitalisation Project
Minister	Hon. Gladys Berejiklian MP Minister for Transport
Date of Minute	9 December 2013

Relationship to Previous Decisions	CM 12 - 392 Newcastle Urban Renewal – Department of Planning and Infrastructure, December 2013. Advances previous decision by identifying the preferred location for the truncation of the heavy rail line at Wickham and the preferred light rail alignment in the Newcastle CBD
---	--

Result of consultations	Agreed
Priority	Routine
Legislative Changes Required	No
Regulatory Impact	No
Minute Type	Policy

1 EXECUTIVE SUMMARY

- 1.1 Urban renewal of Newcastle, NSW's second largest city, is a key government priority. In December 2012, the Minister for Planning and Infrastructure announced the release of a *Newcastle Urban Renewal Strategy* for public comment and the truncation of the Newcastle Rail Line. The Urban renewal strategy proposes a comprehensive and integrated suite of initiatives to deliver urban renewal in the city centre.
- 1.2 The renewal strategy was released along with the government's announcement that buses will replace trains from Wickham station, to open up a number of additional north-south connection points between the city and its waterfront, and remove the current barrier created by heavy rail.
- 1.3 The government has since announced the delivery of light rail in the Newcastle city centre as a key component of the urban renewal strategy for the Newcastle city centre.
- 1.4 Extensive work has now been undertaken to identify and assess options for the location of the heavy rail truncation and a new public transport interchange that can support heavy rail connections to buses and light rail, including options at Wickham, Hamilton, Hamilton Junction and Broadmeadow.
- 1.5 Wickham has been identified as the preferred location for the heavy rail truncation and light rail interchange given it provides the greatest potential for urban revitalisation provides transport customers with access to the future CBD and minimises delivery cost and risk.
- 1.6 Truncation of the heavy rail line can occur at end 2014, however, this would require additional investment in a temporary platform extension to enable train movements to occur for arrivals and departures for the diesel and electric services, new cross-overs, changes to stabling, and new signaling to be installed, which would later become obsolete.
- 1.7 A preferable option is for enabling works to commence in Q1 2015 with truncation occurring in Q3 2015 and all construction, including light rail, to be completed in Q1 2017 (refer to table in section 6 below).
- 1.8 Work has also been undertaken to identify and assess options for the alignment of the light rail route through the Newcastle city centre, and a preferred option has been developed.
- 1.9 The preferred light rail alignment has been identified as the Railway Corridor and Scott Street, continuing to Newcastle Beach (Pacific Park) at Telford Street which supports the urban revitalisation of Newcastle, minimises road impacts as well as the cost and risk of delivery.
 - a. The delivery of light rail in the railway corridor could allow six new road crossings across the corridor in the Newcastle city centre, including Bellevue Street, Steele Street, Worth Place, Darby Street, Argyle Street, Perkins Street and Newcomen Street (Attachment A).

b. In addition, five new pedestrian crossings of the corridor will be opened up, in some instances replacing pedestrian bridges. These include between Hunter Health and Hunter Tafe, west of Civic Station, Wolfe Street, Market Street and Bolton Street.

1.10 A combined railway Corridor and Hunter Street option was also seriously considered, an option popular amongst the local community and Council in order to revitalise Hunter Street. However, based on detailed analysis undertaken in recent months Hunter Street is not the preferred option due to:

1.14.1 space constraints, particularly through the Hunter Street Mall and at the west end of the city centre, which with the addition of light rail would limit footpath space, impact on outdoor event spaces, entertainment and dining opportunities and street greening and cycle ways all of which are key urban renewal initiatives of interest to the Newcastle community;

1.14.2 higher road network impacts and increased road and light rail travel times for an on-road Hunter Street light rail alignment;

1.14.3 removal of on-street car parking, delivery zones and taxi ranks to deliver light rail in Hunter Street which will impact businesses on an ongoing basis; and

1.14.4 higher costs, greater delivery risks and greater impacts on local businesses during construction compared to delivery of light rail in the rail corridor.

1.15 Urban Growth NSW are actively working on plans for their CBD site and investigating wider renewal implementation actions across the city centre.

1.16 Once Transport for NSW have finalised the preferred light rail alignment in early 2014, the Department of Planning and Infrastructure will finalise its Urban Renewal strategy

1.17 The Department of Planning and Infrastructure is doing further work on land use controls to support catalytic developments across the CBD.

1.18 A summary of the reasons for the proposed project are outlined in the table below:

NEW SOUTH WALES – CONFIDENTIAL CABINET MINUTE
SC577-2013

KEY CRITERIA	PREFERRED OPTION PROJECT BENEFITS
Enabling Urban Revitalisation and Connecting the City Centre with the foreshore	<ul style="list-style-type: none"> ✓ A new transport interchange at Wickham allows the greatest potential for transit oriented development at the heart of the new CBD at Wickham with 675,000 m² gross floor area of developable land within 400m radius X A new light rail terminus at Pacific Park provides potential for new residential development in surrounding streets ✓ The delivery of a light rail connection to the beach provides up to 11 locations for road or pedestrian crossings to be implemented, delivering reconnecting Newcastle to its foreshore.
Supporting Future strategic Planning	<ul style="list-style-type: none"> ✓ A new transport interchange at Wickham supports the Newcastle Urban Renewal Strategy, with the development of Wickham as a major destination and Newcastle's CBD Allows footpath widening, cycle ways and greening activities in Hunter Street, in line with the Newcastle Urban Renewal Strategy
Maximising Customer Experience	<ul style="list-style-type: none"> A new interchange at Wickham allows the greatest number of heavy rail customers an uninterrupted journey to the CBD The interchange will be fully at-grade with end-of-platform entry, exit and transfer between heavy rail, light rail, buses and taxis Light rail within the railway corridor provides a faster journey for light rail customers A light rail terminus adjacent to Pacific Park will provide high quality amenity for customers and good passive surveillance for customer safety.
Maximising Transport Network Efficiency	<ul style="list-style-type: none"> A new interchange at Wickham allows the closure of three level crossings at Merewether Street, Stewart Ave and Railway Street A Wickham interchange minimises impacts on the rail freight network A light rail alignment of approximately 2.5km between Wickham and Newcastle Beach will allow more frequent light rail services with fewer light rail vehicles Light rail within the railway corridor will minimise impact on the traffic network and reduce delays for road traffic and light rail customers
Minimising Construction and Operational Costs	<ul style="list-style-type: none"> Light rail in the railway corridor minimises project delivery risks; It is more cost effective to deliver light rail within the existing heavy rail corridor than on Hunter Street; Light rail in the corridor will allow the re-use of some existing heavy rail infrastructure for light rail; The provision of a 2.5km light rail solution can be delivered within the existing budget allocation
Minimising Delivery Risk	<ul style="list-style-type: none"> Delivery of light rail within the rail corridor minimises interaction between customers and construction activities

- Construction of light rail within the rail corridor will have fewer impacts on local business and the transport network than on-road construction in Hunter Street, with fewer delivery risks;

2 RECOMMENDATIONS

It is recommended that the Cabinet Infrastructure Committee:

- ✓ i) **Endorse** the location for truncating the heavy rail line at Wickham to reconnect the city centre to the foreshore and to support future implementation of light rail
- ✗ ii) **Endorse** the proposed schedule for truncation of the heavy rail with early works to commence in Q1 2015 and construction of a new transport interchange at Wickham and light rail to follow;
- ✗ iii) **Endorse** the preferred light rail route alignment between Wickham and Newcastle Beach for public consultation to commence in early 2014;
- iv) **Note** that the option to run light rail down Scott Street instead of entirely in the corridor may require Cabinet to reconsider its prior commitment to retain the entire corridor in public ownership (cabinet decision 12-392). Parts of the corridor have the potential to be used for other purposes, which will be considered as part of the next stage of planning.
- v) **Note** that further amendments to the Newcastle Local Environmental Plan to support catalyst sites will be re-exhibited in early 2014.
- vi) **Note** that the final Urban Renewal Strategy will be released once the city centre light rail alignment has been confirmed.
- vii) **Note** that the proposed light rail solution is the first stage of a future light rail system; ongoing work is occurring to plan a potential wider light rail network linking the CBD with surrounding suburbs, key destinations and the broader Hunter region; and that two potential routes are emerging for future consideration: a route from Wickham down south to the Junction and a route to the west to link the Hunter Stadium.

3 CONSULTATION

- 3.1 The *Newcastle Urban Renewal Strategy* was exhibited from 12 December 2012 to 19 April 2013. 420 written submissions were received. The most dominant issue raised was concern about stopping the heavy rail at Wickham and replacing it with buses.

- 3.2 The Department of Planning and Infrastructure held two public meetings in February 2013 about the renewal strategy. They were attended by more than 400 people.
- 3.3 Infrastructure NSW participated in the Project Control Group, having oversight of the project.
- 3.4 In December 2012 following the announcement of the NSW Government commitment to truncate the heavy rail line at Wickham a Coordination and Delivery Group was established to oversee the delivery of the project.
- 3.5 The Coordination and Delivery Group, comprising the Department of Planning and Infrastructure; Transport for NSW; Hunter Development Corporation; Newcastle City Council; and three community representatives, have provided governance and input to the truncation and light rail options identification and assessment process.
- 3.6 Consultation has commenced with key stakeholders including Newcastle City Council, NSW Government agencies and transport experts.
- 3.7 Broad community consultation is now required at four key points in the project:
 - 3.7.1 December 2013: Inform key stakeholders and the community of the transport interchange/truncation location and the preferred light rail route alignment for the first stage of the light rail system. A community brochure is being prepared for this purpose.
 - 3.7.2 January-February 2014: Seek feedback from key stakeholders and the community on the preferred light rail alignment.
 - 3.7.3 Mid-late 2014: Seek formal feedback on the preferred project, as set out in the statutory approval documentation.
- 3.8 Communication is proposed with the community around detailed design and construction beyond 2014 through:
 - 3.8.1 Targeted meetings with key stakeholders, to gain detailed input to planning for the Newcastle Light Rail;
 - 3.8.2 Communication materials and channels, including a project information and consultation brochure, web page, media releases, posters, local newspaper advertisements, fact sheets, billboards and signage, and email; and
 - 3.8.3 Local project information sessions and information stalls to capture feedback from the broader community.

4 RISKS AND MITIGATION

- 4.1 Consultation on the location of a heavy rail terminus and light rail interchange:
 - 4.1.1 There is a high level of community interest in the Newcastle revitalisation project and therefore there is a risk that the community

expects to be consulted on all aspects of the Newcastle light rail project, including the location of a heavy rail terminus and light rail interchange.

- 4.1.2 An inclusive community engagement process in early 2014 will assist with reducing this risk. This will include providing clear information about how the options were arrived at, opportunities and constraints of each and how the community can get involved and have their say going forwards.

4.2 Statutory Approvals:

4.2.1 At this stage it is not clear whether an Environmental Impact Statement (EIS) or a Review of Environmental Factors (REF) will be required for heavy rail truncation. Statutory approvals via EIS take approximately 3 months longer than REF. At present the indicative heavy rail delivery schedule is predicated on the basis that an REF is required.

4.2.2 Transport for NSW is seeking further advice on the requirements for Statutory Approvals in relation to this project and will factor the advice received into a master schedule.

5. FINANCIAL IMPACT

- 5.1 In support of the announcement of light rail a base case cost estimate was developed at \$450m (excluding \$10m future network planning and urban revitalisation) based on the truncation at Wickham (\$295m) and a light rail scheme travelling in corridor between Wickham and Newcastle (Watt St) and utilising the existing track work (\$155m).
- 5.2 These costs include a heavy rail terminus and light rail interchange, light rail trackwork, light rail fleet, stabling facilities for heavy rail and light rail, provision of additional road and pedestrian crossings, removal of redundant pedestrian bridges, bus interchange and required power systems changes.
- 5.3 Funds of \$120 million have already been committed by the NSW Government towards the truncation of the heavy rail line and revitalisation activities in Newcastle.
- 5.4 A further \$340million from the 99-year lease of the Port of Newcastle, scheduled for completion in mid-2014, will also be allocated to the revitalisation project.
- 5.5 \$10 million of these funds will be allocated to explore the potential for this link to be the basis for light rail linking the CBD with surrounding suburbs, beaches and the broader Hunter region.
- 5.6 Of the \$460m committed by the NSW Government to the revitalisation project, \$20m was provisionally allocated to revitalisation activities for

*Subject to
funding
of info to
Therms
& HLF*

NEW SOUTH WALES - CONFIDENTIAL CABINET MINUTE
SC577-2013

initiatives identified in the Department of Planning and Infrastructure's *Renewal Strategy* (Cabinet Decision 10/12/12).

5.7 Early feasibility level engineering indicates that savings up to \$60m of the base case estimate for the project may be possible from:

5.7.1 Location of heavy rail stabling east of Hamilton station, instead of Hamilton Yard;

5.7.2 Re-design of the turn-back and provision of 3 rather than 4 platforms at Wickham.

5.8 Extending to Newcastle Beach (Pacific Park) at Telford Street, an additional 350m beyond Newcastle Station via Scott Street, will increase costs by approximately \$30-40M.

Terminus Options	Previous Base Case	Light Rail Alignment Options			
		In corridor		On road from Bellevue St	
		New base case Eg to Watt St	to Pacific Park (Beach Option)	to Watt St	to Pacific Park
	\$m	\$m	\$m	\$m	\$m
<u>Wickham</u> (includes \$220m for truncation)	450	390	430 (preferred)	570	600
<u>Hamilton</u> (includes \$223m for truncation)		460	500	640	670
<u>Broadmeadow</u> (includes \$274m for truncation)		600	640	780	810
<u>Hamilton/Wickham split</u> (includes \$266m for truncation)		500	540	680	710

5.9 Further design and operational investigations are required before scope can be finalised and costs confirmed. This includes defining the design of the future light rail corridor and whether ballasted rail track would be maintained outside of existing intersections and new crossings. If ballasted track was to be converted to an at-grade finish for the entire light rail alignment an additional cost impact is expected as detailed below.

5.10 Value management studies will be undertaken throughout the process to look for cost reductions and savings in project delivery.

A full table of comparative costs is shown at ATTACHMENT B.

Treatment of the Corridor

5.11 The treatment of the existing heavy rail corridor for the construction of light rail will have cost implications.

5.12 Utilising existing ballast and refurbishing track for light rail vehicles is the lowest cost option and may be appropriate in areas where expected pedestrian and crossing activity are low.

5.13 However, maintaining ballasted track limits the benefits of light rail against strategic objectives for the Newcastle city centre. Maintaining ballast and the heavy rail track profile will:

5.13.1 reduce the visual amenity of the light rail system in the city centre;

5.13.2 maintain a physical barrier between the city centre and the foreshore due to the raised height of the ballast and track;

5.13.3 minimise public access across the corridor due to public safety and contamination issues; and

5.13.4 lessen the transformative impact of the replacement of heavy rail with a light rail solution for the city centre.

5.14 Removing the ballast and reducing the profile of the heavy rail tracks with a concrete or grassed surface has a greater cost impact. However, it would provide greater amenity in line with urban renewal objectives and the desire to re-shape Newcastle as a modern, vibrant city centre.

5.15 Options for the entire track to be concreted or a mixture of concrete and grass are also being explored for an additional preliminary cost estimate of around \$15 to \$20 million.

6. BACKGROUND AND SUPPORTING INFORMATION

6.1 In December 2012, the Minister for Planning and Infrastructure announced the truncation of the Newcastle Rail Line and the release of a *Newcastle Urban Renewal Strategy*.

- 6.2 The *Newcastle Urban Renewal Strategy* (the renewal strategy) recommends an integrated package of place-based, economic and transport-related initiatives for the long-term successful renewal of the city centre including:
- 6.2.1 amended planning controls that promote growth, activity, development and well-located land uses
 - 6.2.2 a place making approach to the future development of the city
 - 6.2.3 physical improvements to the city's key public domain areas
 - 6.2.4 enhanced physical and visual connections between the city centre and the waterfront
 - 6.2.5 economic initiatives to support renewal
 - 6.2.6 a strategy to promote transport, access and connectivity to and within the city centre
 - 6.2.7 an implementation plan that sets a clear delivery framework.
- 6.3 The initiatives in the strategy are a series of clear, specific actions to ensure they can be delivered. They focus on achieving outcomes for Newcastle. The initiatives will need to be delivered in stages over the short, medium and long-term. Together, the strategy and initiatives seek to ensure that:
- 6.3.1 the strength of the city centre is recognised and reinforced, relative to other centres within the local government area
 - 6.3.2 the city centre is a vibrant, viable and attractive destination for businesses, residents and visitors, and minimises the need to travel to outlying centres
 - 6.3.3 the city centre provides accessible and suitable employment opportunities as well as a mix of retail and service facilities for the community
 - 6.3.4 the city centre's retail and employment lands are attractive for investment by local, national and international businesses, both now and in the future
 - 6.3.5 the city centre is permeable, all parts are well-connected and easy to access
- 6.4 In June 2013, the NSW Government announced a strategy to drive the economic growth and renewal of Newcastle as part of the 2013-2014 NSW Budget.
- 6.5 A 99-year lease of Newcastle Port is expected to be completed by mid 2014.
- 6.6 Of the proceeds, \$340 million will be directed towards the revitalisation of Newcastle. This is in addition to the \$120 million the Government has already committed to this project. Central to this funding commitment is a

proposal for light rail from Wickham to Newcastle and the truncation of the Newcastle rail line at Wickham.

- 6.7 \$10 million has been allocated to explore the potential for this central light rail link to be the basis for light rail linking the CBD with surrounding suburbs, beaches and the broader Hunter region.
- 6.8 Light rail will enhance and accelerate the city centre's renewal and will deliver greater north-south connectivity between the city centre and its waterfront and increased public transport choices. It will promote transport, access and connections in and around the city centre.
- 6.9 The delivery of light rail in the Newcastle city centre may open up development opportunities within the former corridor at the eastern end, adjacent to Scott Street. For these opportunities to be realised, the government's previous position of retaining the corridor in public ownership (cabinet decision 12-392) will need to be revisited.
- 6.10 Given the context has significantly changed since the prior decision, with \$340 million of additional government investment committed and a different public transport solution, it is reasonable to re-evaluate this commitment for this section of the corridor in light of also seeking to arrive at the optimum light rail route from a collective renewal and transport perspective.
- 6.11 Once Transport for NSW have finalised the preferred light rail alignment in early 2014, the department can finalise its renewal strategy.

Transport Options Identification

- 6.12 TfNSW, in consultation with other agencies and key stakeholders, has undertaken a comprehensive process to identify the best solution for Newcastle considering:
 - 6.12.1 the best location for a heavy rail terminus and light rail interchange; and
 - 6.12.2 the best light rail route alignment within the city centre.
- 6.13 The options were identified through a variety of sources including:
 - 6.13.1 workshops with representatives from state agencies and Newcastle City Council;
 - 6.13.2 transport cluster workshops and meetings;
 - 6.13.3 key stakeholder submissions and reports;
 - 6.13.4 review of media coverage and public response;
 - 6.13.5 an audit of previous technical reports and studies; and
 - 6.13.6 site and route inspections for each option.

Options Assessment

- 6.14 Assessment criteria were established to provide a robust framework to assess the options, across 6 strategic objectives:
- 6.14.1 Enabling Urban Revitalisation and Re-connecting the City Centre with the Foreshore
 - 6.14.2 Supporting Future Planning
 - 6.14.3 Maximising Customer Experience
 - 6.14.4 Maximising Transport Network Efficiency
 - 6.14.5 Minimising Construction and Operational Costs
 - 6.14.6 Minimising Delivery Risk
- 6.15 Assessment criteria and assessment measures are provided at **ATTACHMENT C.**

Decision on the heavy rail terminus and light rail interchange

- 6.16 Through a comprehensive strategic assessment and multi-criteria process against the assessment criteria, Wickham has been identified as the preferred location for a heavy rail terminus and light rail interchange as part of an integrated transport solution for Newcastle.
- 6.17 In total eight options were considered between Wickham and Broadmeadow.
- 6.18 The analysis considered an integrated transport solution including required heavy rail stabling, light rail fleet and infrastructure and bus servicing requirements.
- 6.19 The benefits and challenges of each option are shown at **ATTACHMENT D.**
- 6.20 The short list of options for the location of the heavy rail terminus and light rail interchange, considering an in-corridor light rail solution to Newcastle station included:
- 6.20.1 Wickham, west of Stewart Avenue (with 2.2km of light rail to Newcastle station)
 - 6.20.2 Hamilton, east of Beaumont Street (with 3.5km of light rail to Newcastle)
 - 6.20.3 Broadmeadow (with 5.1km of light rail to Newcastle station)
 - 6.20.4 Wickham and Hamilton east (with 3.5km of light rail to Newcastle station)
- 6.21 The results of the strategic assessment and multi-criteria analysis are provided at **ATTACHMENT E** and show in further detail why Wickham was selected.
- 6.22 Key benefits for the Wickham location include:

- 6.22.1 Supports the Newcastle Urban Renewal Strategy plans for development, employment and population growth at Wickham as the future Newcastle CBD;
 - 6.22.2 Creates a transport gateway to the future Newcastle city centre, and good access to the Honeysuckle business, entertainment and residential precincts;
 - 6.22.3 Provides 675,000 m² gross floor area and 11.5 ha of unfragmented land for transit oriented development at the site of the future CBD;
 - 6.22.4 Provides the best transport customer outcome, allowing a large number of heavy rail customers to reach their destination of the Newcastle CBD at Wickham without transferring between transport services;
 - 6.22.5 Provides the best solution for Upper Hunter customers accessing the city centre by delivering them to the new CBD;
 - 6.22.6 Allows the delivery of a fully accessible, at-grade station precinct with easy cross-platform or end-of-platform interchange between heavy rail and light rail, and at grade access to bus interchange;
 - 6.22.7 More frequent light rail services, proven to encourage higher patronage, can be provided with fewer light rail vehicles due to a shorter route (2.5km between Wickham and Newcastle Beach);
 - 6.22.8 Closure of three railway level crossings, with two converted to road/light rail crossings (Stewart Ave and Merewether St), and one closed to all traffic, subject to further investigation (Railway St);
 - 6.22.9 Reduced train movements through the Beaumont Street level crossing (as shunting and stabling will occur east of the intersection, rather than crossing the road);
 - 6.22.10 Enables operational efficiencies by consolidating Sydney and NSW Trains staff and training facilities which are currently distributed across 15 Newcastle sites;
 - 6.22.11 Does not interfere with freight operations or track arrangements;
 - 6.22.12 Provides the lowest cost option for the truncation of the heavy rail line, the construction of a new transport interchange and the delivery of light rail to Newcastle.
- 6.23 The length of the Wickham solution as the first stage of a light rail system for Newcastle could result in some community objection and challenge:
- 6.23.1 A light rail link provided between Wickham and Newcastle Beach (Pacific Park) via Scott Street, would be approximately 2.5km in length.
 - 6.23.2 There is a risk that this link will be viewed as too short to deliver real benefit to Newcastle city centre and encourage public transport uptake.
 - 6.23.3 However, this system would be the first stage and the spine of a future system.

- 6.23.4 Frequency is a key driver of the forecast patronage and a shorter light rail line solution between Wickham and the eastern end of the city centre would allow the provision of more frequent light rail services using fewer light rail vehicles.
- 6.23.5 International case studies provide good examples of successful light rail services of comparative length, including Seville (1.4km); Tacoma, Washington (2.6km); and Seattle, Washington (2.1km).
- 6.23.6 These services provide successful, inner-urban light rail systems which reach key destinations, provide an attractive public transport service for short trips in the city centre, and address localised congestion.
- 6.23.7 In some instances, initial shorter routes have been extended at a later stage to cover more of the inner urban area and more destinations, such as the Portland streetcar system which had an original length of 5.6km and is now 11.6km long.

Data: Existing Conditions

- 6.24 As part of the options identification work, data collection was undertaken to establish existing conditions and to inform modeling processes.
- 6.25 Car is the predominant mode of transport in Newcastle. Only 5% of employees in Newcastle LGA and 13% for employees in the city centre commute by public transport.
- 6.26 There are approximately 2,200 bus trips each day travelling wholly within the city centre fare free zone. This accounts for 8% of all daily bus trips throughout Newcastle.
- 6.27 Counts were conducted for passengers alighting and boarding all trains at all stations east of Broadmeadow on an average weekday. Key findings include:
 - 6.27.1 Less than 10% of passengers using Broadmeadow and Hamilton Stations travel east towards Newcastle.
 - 6.27.2 The vast majority of passengers using Broadmeadow and Hamilton Stations travel north towards Maitland on Hunter Line services, or south on Central Coast and Sydney services.
 - 6.27.3 This indicates that extending the light rail further west to Hamilton or Broadmeadow would not significantly increase the light rail patronage into the Newcastle city centre at this time.
 - 6.27.4 While a very small number of passengers boarded Newcastle-bound trains at Wickham and Civic, 2,398 passengers alighted heavy rail services at Wickham, Civic and Newcastle Stations.
 - 6.27.5 2,266 passengers boarded west-bound heavy rail services at Newcastle, Civic and Wickham Stations.
- 6.28 It is anticipated that light rail would provide approximately six stops between Wickham and Newcastle, increasing accessibility and uptake of the service for short local trips.

- 6.29 This data will also be used to inform the number and frequency of light rail vehicles required to accommodate heavy rail passengers transferring to light rail services at Wickham.
- 6.30 Terminating heavy rail services at Wickham minimises the disruption to heavy rail passengers accessing the city centre. It provides uninterrupted access to the CBD for the 570 customers currently alighting at Wickham Station each day.
- 6.31 Light rail would provide those passengers currently alighting delivers those customers alighting at Civic Station (875 daily) and Newcastle Station (980 daily) the opportunity to continue by light rail to their destination.
- 6.32 As Wickham has been identified as the new business precinct under the *Newcastle Urban Renewal Strategy*, a Wickham interchange will deliver passengers to the heart of the CBD.

Data - Demand Forecasts

- 6.33 A bespoke demand model was built (from data collected, including passenger counts and origin/destination surveys in September 2013) to consider the alternative future transport options for Newcastle.
- 6.34 Key aspects of the project definition tested in the demand model were:
- 6.34.1 Rail truncation at Wickham, Hamilton, Broadmeadow or Hamilton/Wickham;
 - 6.34.2 Ten minute headway for light rail;
 - 6.34.3 Light rail stops at and in-between each of the current heavy rail stations;
 - 6.34.4 Passengers transferring from other modes would incur a second 'flag fall' fare.
 - 6.34.5 The current city centre bus fare free zone would be removed.
 - 6.34.6 Reconfigured bus network to coincide with light rail stops and the removal of some buses along the entire length of Hunter Street.
 - 6.34.7 Additional population and employment throughout the city centre, consistent with the Newcastle Urban Renewal Strategy (including a new CBD at Wickham).
- 6.35 Key outcomes from the preliminary demand modelling include:
- 6.35.1 Over 80% of light rail passengers also use heavy rail. The quality of the interchange experience is therefore an important consideration.
 - 6.35.2 Truncating the rail line at Wickham impacts the fewest heavy rail users. The number of existing daily rail users impacted by each truncation option are: Wickham 3,900; Hamilton 5,100; Broadmeadow 7,100; and Hamilton/Wickham 4,500.
 - 6.35.3 The Wickham truncation option results in the lowest light rail patronage, particularly given many customers are projected to walk to their final destination given current modelling assumptions. However, this could change with further future urban development

and a different ticketing and service frequency approach.

- 6.35.4 Truncating the rail line at Hamilton and Broadmeadow reduces the opportunity for heavy rail passengers to reach their final destination by foot.
- 6.35.5 Daily light rail patronage forecasts under the four options tested are: Wickham 1,800; Hamilton 2,500; Broadmeadow 3,200; and Hamilton/Wickham 1,900.
- 6.35.6 Operating at a higher frequency (5 minutes) and removing the second 'flag fall' fare would increase light rail patronage by 2.5 fold. Further consideration of light rail operations and fares may be warranted.

Light Rail Route Alignment in the City Centre

- 6.36 The base case for a new light rail solution between Wickham Station and the existing Newcastle Station considered light rail in the existing rail corridor.
- 6.37 Eight options for route alignment were identified and assessed. The benefits and challenges of each option are shown at **ATTACHMENT F**.
- 6.38 A strategic assessment was undertaken to determine a short list of light rail route alignment options and this short list includes:
 - 6.38.1 Railway corridor
 - 6.38.2 Hunter Street and Scott Street
 - 6.38.3 Hunter Street and Hunter Street Mall
 - 6.38.4 Railway Corridor and Scott Street
 - 6.38.5 Railway Corridor and Hunter Street Mall.
- 6.39 A key factor in determining the preferred light rail route option was how the light rail route alignment will support the urban revitalisation of Newcastle.
- 6.40 For all alignment options stops will be planned to support urban revitalisation objectives, including key development sites such as the new university campus and the major development precinct at the eastern end of Hunter Street.
- 6.41 The results of the strategic assessment are provided at **Attachment G**.
- 6.42 Through the comprehensive strategic assessment and multi-criteria process, the Railway Corridor and Scott Street option has been identified as the preferred route alignment in the city centre. Benefits of this alignment include:
 - 6.42.1 The railway corridor provides a more efficient light rail service with less interference from other traffic;
 - 6.42.2 It is more cost effective to deliver light rail within the existing heavy rail corridor than on Hunter Street, and will allow the re-use of some existing heavy rail infrastructure for light rail;

- 6.42.3 Light rail within the railway corridor and Scott Street with a beach extension can be accommodated within the current budget allocation;
- 6.42.4 Light rail within the heavy rail corridor allows more space for initiatives outlined in the *Newcastle Urban Renewal Strategy* on Hunter Street, including footpath widening, cycle ways and greening of the street;
- 6.42.5 Utilising the heavy rail corridor minimises overall transport network impacts including impacts on traffic times and signals, removal of parking, taxi stops and loading zones, and the delivery of separated cycle ways on Hunter Street;
- 6.42.6 Construction of light rail within the rail corridor will have fewer impacts on local business and the transport network than on-road construction in Hunter Street, with fewer delivery risks;
- 6.42.7 The delivery of light rail in Scott Street allows delivery of the preferred extension to Newcastle Beach (Pacific Park).
- 6.43 Wharf Road was considered too close to the water, limiting its patronage catchment, while King Street was considered not to support urban renewal objectives by drawing patronage away from the key activity precincts.
- 6.44 There are a number of locations where light rail could leave the rail corridor to join Hunter Street, providing hybrid options of the Railway Corridor and Hunter Street options.
- 6.45 However, a key consideration is the higher cost of providing an on-road light rail solution in Hunter Street in comparison to the lower cost option of providing light rail in the existing corridor.
- 6.46 In addition, the Hunter Street Mall is a constrained space that would be severely impacted by light rail. Light rail through the mall would likely require the removal of on-street parking and trees, and not permit wider footpaths or street greening revitalisation initiatives to take place.
- 6.47 It is considered that an alignment including Hunter Street Mall does not provide the best urban renewal outcomes for the precinct.
- 6.48 The proximity of the existing rail corridor to Hunter Street through the city centre ensures that urban revitalisation outcomes can still be achieved if light rail is delivered within the existing corridor.
- 6.49 A railway corridor alignment also allows Hunter Street to be the focus of renewal initiatives including street greening, footpath widening and cycle ways.
- 6.50 Public consultation will be undertaken to allow local businesses, local industry and the community to provide their feedback on the preferred alignment.
- 6.51 This will inform the final light rail route alignment for the Newcastle City Centre considering the urban revitalisation objectives for this project.

- 6.52 If the corridor is not to be used for the light rail, consideration may need to be given to the best use of the corridor in support of the revitalisation of Newcastle, and the cost of corridor remediation and treatment.

Extension to the Beach

- 6.53 Four options have also been identified on potential extensions of the light rail solution to the Newcastle beaches, shown at **ATTACHMENT H**.

- 6.54 These options are dependent upon light rail alignment selected.

- 6.55 Beach extension options include:

- 6.55.1 Nobbys Beach via Wharf Rd
- 6.55.2 Nobbys Beach via Parnell Place, via Scott Street, Parnell Place and Nobbys Road
- 6.55.3 Newcastle Beach at Zaara St, extension to Newcastle Beach at Zaara Street via Scott Street
- 6.55.4 Newcastle Beach at Telford St, extension to Newcastle Beach to Telford St (Pacific Park) via Scott Street
- 6.55.5 Pacific Park from Hunter St, extension to Pacific Park via Hunter Street

- 6.56 It is proposed that beach extension options are included as part of the package of works in delivering the route alignment in the Newcastle city centre, creating a "Wickham to the Beach" light rail solution for public consultation.

- 6.57 An initial evaluation of these options has been completed and Newcastle Station to Newcastle Beach at Telford Street has been identified as the preferred option (**ATTACHMENT J**). Benefits of this option include:

- 6.57.1 The delivery of a short 350m extension from Scott Street east of Watt Street at the Newcastle Station to Telford Street along the eastern perimeter of Pacific Park;;
- 6.57.2 Convenient access to the Newcastle Beach pedestrian underpass, the businesses and cafes in Scott Street and the residential areas in Newcastle East;
- 6.57.3 A suitable terminus location adjacent to Pacific Park, with high quality amenity in Pacific Park for customers and good passive surveillance for customer safety;
- 6.57.4 Potential for new high density residential development exists in the surrounding streets, and for new cafes and shops within view of the light rail terminus; and
- 6.57.5 Bus routes that currently operate to Parnell Place could be truncated at Queens Wharf, saving on bus service-kilometers and operating costs.

Wider network planning

- 6.58 Funding of \$10 million has been allocated to explore the potential for the

light rail link to be the basis for light rail linking the CBD with surrounding suburbs, beaches and the broader Hunter region.

- 6.59 Work has commenced to determine the best location for a future light rail network and to ensure that current planning for the core light rail alignment in the city centre does not preclude future extensions of the line.
- 6.60 From a Wickham interchange, one potential future extension could head west, in-street, towards the south of Beaumont St, Broadmeadow and the Hunter Stadium. Another extension option could head south to the Junction (ATTACHMENT I). Potential future extensions are subject to further planning work.
- 6.61 This work is now being expanded upon and will be finalised in Q4 2014, with a focus on key destinations including, but not limited to Hunter Stadium, John Hunter Hospital, Mater Hospital, key entertainment and shopping precincts, and the University of Newcastle.

Road and Freight Issues

- 6.62 A key criteria in the assessment of options for the heavy rail terminus and light rail interchange was to maximize the transport network efficiency which considered the impact on the wider transport network including road and freight.
- 6.63 Location of the new interchange at Wickham does not create the same rail freight impacts of the Broadmeadow, Donald Street and Hamilton Junction options.
- 6.64 The Wickham truncation will result in the removal of three railway level crossings, with two converted to road/light rail crossings (Stewart Ave and Merewether St), and one closed to all traffic, subject to further investigation (Railway St);
- 6.65 Railway Street is a low level local road and that the impacts of the potential closure of the street are manageable and not significant.
- 6.66 Impacts on road traffic, cars, delivery vehicles, pedestrians and cyclists are an important consideration in the assessment of the light rail route alignment.
- 6.67 The preferred light rail route alignment is the Railway Corridor and Scott Street. The advantages of this option include:
 - 6.67.1 Minimises travel times for road traffic and light rail customers, whereas a full Hunter Street solution would increase travel times for traffic and light rail customers;
 - 6.67.2 Reduces the removal of on-street parking in the retail precinct;
 - 6.67.3 Reduces removal of loading zones to access businesses in the retail precinct;
 - 6.67.4 Avoids the relocation of bus stops and taxi ranks in Hunter Street;
 - 6.67.5 Increases space for cycleways on Hunter Street; and

- 6.67.6 Retains opportunities for footpath widening, activity zones and greening in Hunter Street, all key initiatives outlined in the *Newcastle Urban Renewal Strategy*.

Bus Servicing Strategy

- 6.68 Bus servicing plans for the Newcastle Light Rail have been developed for the three stages of the project, as follows:
- 6.69 Stage 1: during the construction of the heavy rail terminus and bus and light rail interchange at Wickham when the train services on the Newcastle Branch Line will be terminated at Broadmeadow or Hamilton;
- 6.69.1 The closure of the Newcastle Branch Line typically occurs four times each year for a weekend or up to two weeks by Sydney Trains and NSW Trains to undertake essential maintenance works on the Main North and Hunter Lines affecting InterCity Services between Broadmeadow and Newcastle.
- 6.69.2 During the construction of the new heavy rail terminus and bus interchange at Wickham, all electric trains from Sydney and the Central Coast, and all diesel trains from the Hunter Line would terminate at Broadmeadow or Hamilton.
- 6.69.3 Two bus services would replace train services, one servicing all stations via Hamilton, and the other providing an express service to Wickham and then all stops to Newcastle Station. Both bus services would stop at locations approximating new light rail stops between Wickham and Newcastle.
- 6.69.4 Due to available capacity on Newcastle city centre bus services, it is anticipated that these services can be amended for the construction period rather than exclusively providing dedicated rail replacement services.
- 6.70 Stage 2: During the construction of the light rail line, light rail stops, stabling and light rail depot facilities:
- 6.70.1 Once the new terminus at Wickham is operational, a shuttle bus service will be required to allow customers to complete their journey from Wickham to Newcastle, replicating the new light rail stopping patterns as closely as possible.
- 6.70.2 In addition to the bus shuttle route between Wickham and Newcastle, a new restructured bus network will be implemented when the new Wickham bus interchange is open, with many of the existing bus routes that terminate at the Newcastle bus interchange terminating at Marketown or the new Wickham bus interchange.
- 6.71 Stage 3: For the completed Newcastle Light Rail project with the first stage of light rail operational between Wickham and Newcastle Beach

- 6.71.1 Following the delivery of light rail in the city centre, bus services travelling on Hunter Street and to Queens Wharf would be significantly reduced, while increased bus services would service Marketown and Wickham interchange at the eastern end of the CBD.

Progress of planning work

- 6.72 Finalisation of the new planning framework for the city centre is progressing. This involves the final renewal strategy, amendments to council's Local Environmental Plan(LEP) and a Development Control Plan (DCP).
- 6.73 In resolving issues raised during the exhibition of the renewal strategy, the department has been engaging with key stakeholders and landholders. Some of these land holders own sites with the potential to be significant catalysts for wider renewal of the city centre.
- 6.74 Three key land holders have recently approached the department with requests to make further amendments to the proposed LEP controls. The reason for this is that each has engaged consultants and progressed more detailed work for their site. Out of this work additional issues and opportunities for the final developments have been identified. The three sites in question are:
- 6.69.1 the GPT / UrbanGrowth NSW site in the east end of Newcastle CBD
 - 6.69.2 the university site in the civic precinct
 - 6.69.3 the Sacred Heart Cathedral site in the west end of Newcastle CBD
- 6.75 The proposals will require the department to re-exhibit amendments to the LEP controls, applying only to these three sites. The exhibition will be accompanied by clear material explaining why the changes are necessary to support these significant catalyst sites, any impacts and the public benefit.
- 6.76 The amendments to the LEP will be exhibited in early 2014. As this proposes changes on three discrete sites, there will not be any conflict with TfNSW's public consultation on light rail alignment options. Notwithstanding, the messaging during exhibition will be coordinated closely with TfNSW to ensure consistency.
- 6.77 Following exhibition the LEP can be finalised ahead of the final renewal strategy, to amend the planning controls.
- 6.78 The final strategy will be the overarching document that provides an integrated vision for the city centre's renewal. It therefore needs to incorporate the final route alignment for light rail given each alignment option has different implications for the strategy and how the corridor and the land beside it will be used.
- 6.79 The final alignment will be known following TfNSW's public consultation in early 2014. The strategy may need to re-examine the planning framework

needed for different parts of the city centre and corridor. Therefore the strategy will be finalised once the final city centre light rail alignment is known.

Implementation Schedule

- 6.80 There are a number of potential ways of staging construction works. Each has a differing impact on customers, stakeholders and the speed with which the corridor can be opened up to facilitate the revitalisation of Newcastle.
- 6.81 The approaches are:
- 6.81.1 a transport customer-centric approach – which maintains heavy rail access to Newcastle Station for as long as possible; and
 - 6.81.2 an urban revitalisation-centric approach - which provides access between the CBD and the foreshore as soon as possible.
- 6.82 Balancing the needs of the transport customer with the desire for urban revitalisation and speedy and efficient delivery of the project the proposed approach entails the truncation of the line when major project construction works commence in Q3 2015.
- 6.83 The advantages of this approach are:
- 6.83.1 Enabling work can still get underway in Q1 2015;
 - 6.83.2 This allows sufficient time to establish a robust temporary operating configuration and secure statutory approvals;
 - 6.83.3 Minimises the time for which customers are forced to interchange at Broadmeadow or Hamilton and bus to their destination in the CBD given that Broadmeadow/Hamilton would need to be the interim truncation location
 - 6.83.4 Minimises the risks, challenges and costs associated with undertaking construction adjacent to an operational railway;
 - 6.83.5 Enables the truncation of the rail line to be immediately followed by significant works getting underway for the project;
 - 6.83.6 Revitalisation is enabled with additional crossing points being implemented as soon as the line is truncated
- 6.84 However, earlier truncation could be achieved by commencing in Q4 2014, however to achieve this would negatively impact customers through forced interchange and increased journey times for a prolonged period of time and would require the following to be in place:
- Approvals to truncate the rail line;
 - A temporary operating solution, which may require heavy rail timetable and infrastructure changes;
 - An interim bus servicing solution; and
 - Funding for these interim activities.

Delivery Timeframes

6.85 The indicative delivery timeframes associated with the construction of a new interchange and implementation of light rail are set out below. It should be noted that further work is required to define these timeframes in greater detail particularly regarding statutory approvals processes.

Milestone	Delivery of a new Heavy Rail Terminus	Delivery of a Light Rail Solution
Appoint Engineering & Operations PSC	Q4 2013	Q1 2014
Product Definition Report & Business Requirements Specification	Q1 2014	Q2 2014
Community Consultation - Light Rail Alignment		Q1 2014
Scoping Phase Report (incl. Cost Estimate, Delivery Schedule)	Q2 2014	Q4 2014
Definition Phase Report (incl. Cost Estimate, Delivery Schedule)	Q3 2014	Q4 2014
Planning Approval - Heavy Rail Interchange (REF assumed)	Q1 2015	
Planning Approval - Light Rail (EIS)		Q3 2015
Request for Tender - Design & Construction	Q4 2014	Q1 2015
Earliest possible date for Rail truncation (Urban revitalisation centric approach)	Q4 2014	Q4 2014
Contract Award	Q1 2015	Q3 2015
Construction Start (Enabling Works)	End Q1 2015	Q4 2015
Proposed truncation date	Q3 2015	Q3 2015
Full Construction Starts	Q3-2015	Q1 2016
Latest possible date for Rail Truncation (Transport customer-centric approach)	Q1 2016	Q1 2016
Construction Complete	Q1-2017	Q1-2017 (or Q3-2017 if in street)

- 6.86 Further work is required to define timeframes in greater detail.
- 6.87 Enabling works for the heavy rail work involve relocation of existing services that are required for the continued safe operation of the railway during construction up until they are no longer required or are replaced with new systems.
- 6.88 Enabling works for light rail relate to clearing the construction zones of any services and utilities, particularly those that must remain in continuing operation during the construction period such as electricity, gas and telecoms services. For light rail options within the streets arrangements for temporary property access would also be undertaken.
- 6.89 Full construction refers to the delivery of stabling, station platforms, signalling, interchange facilities, staff facilities, customer information and wayfinding and other infrastructure.
- 6.90 Earliest date for rail truncation to support reconnecting the CBD to the foreshore is dependent upon operational readiness, temporary infrastructure delivery, statutory approvals, funding requirements and is subject to further investigations.
- 6.91 Latest date for truncation to enable customers to travel to Newcastle on train for as long as possible.

7 IMPACT ON REGIONAL AND RURAL COMMUNITIES

- 7.1 Investment in the Newcastle city centre will support the revitalisation of NSW's largest regional city in line with the NSW Government's *Newcastle Urban Renewal Strategy 2012*.
- 7.2 It will drive the economic growth and revitalisation of the Newcastle city centre, attracting an additional 12,600 residents and 10,000 jobs by 2036.
- 7.3 Reuniting the Newcastle city centre with its waterfront will unlock the enormous potential of the city, attracting private development and making it a diverse, vibrant and attractive place for visitors and locals.
- 7.4 The project will benefit not only the Newcastle city centre, but also the wider Hunter region and other areas of regional NSW which rely on Newcastle as their regional city.
- 7.5 The delivery of a new transport interchange at Wickham will allow customers travelling from the Upper Hunter and Maitland to the CBD at Wickham without interruption to their train journey.

8 REGULATORY IMPACT

- 8.1 Not applicable.

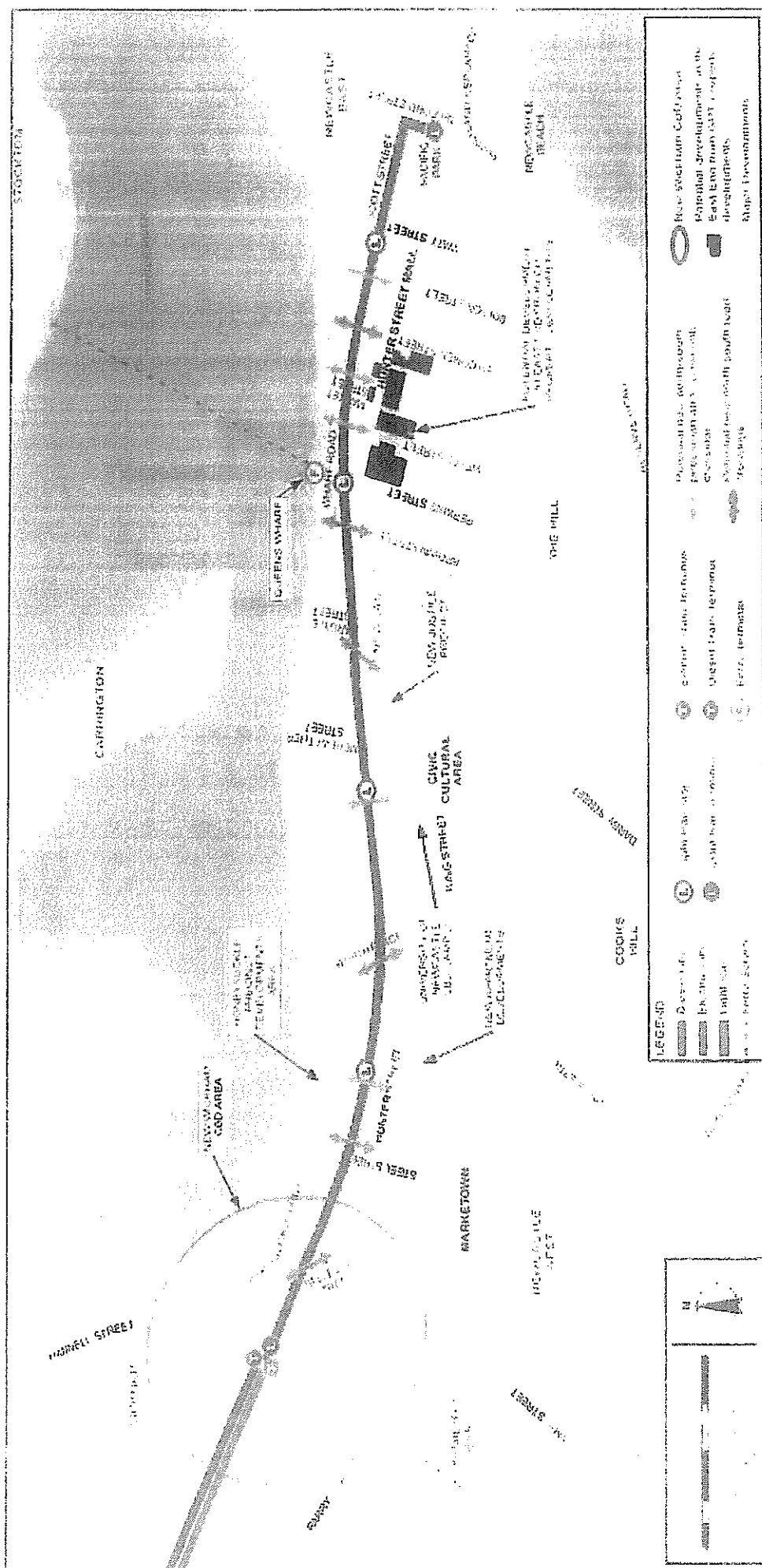
9 ATTACHMENTS

- 9.1 Attachment A: Light Rail Preferred Option and Proposed New Crossings
- 9.2 Attachment B: Comparative Costs
- 9.3 Attachment C: Assessment Criteria
- 9.4 Attachment D: Heavy Rail Terminus and Light Rail Interchange Options
- 9.5 Attachment E: Heavy Rail Terminus and Light Rail Interchange Options Assessment
- 9.6 Attachment F: Light Rail Route Alignment Options
- 9.7 Attachment G: Light Rail Route Alignment Options Assessment
- 9.8 Attachment H: Light Rail Beach Alignment Options
- 9.9 Attachment I: Light Rail Beach Alignment Options Assessment
- 9.10 Attachment J: Potential Future Light Rail Connections



Gladys Berejiklian
Minister for Transport

ATTACHMENT A: Light Rail Preferred Option & Proposed New Crossings



ATTACHMENT B -- Comparative Costs

Indicative Cost Estimate for heavy rail truncation and construction of new Interchange

	Wickham	Hamilton	Broadmeadow	Split Option	E&P Jan 2013
Stabling	\$25,482,022	\$25,702,495	\$24,244,204	\$20,905,430	\$45,628,051
Turnback	\$16,551,441	\$13,584,820	\$34,061,920	\$21,384,260	\$21,442,868
Station and Interchanges	\$21,924,733	\$23,929,090	\$18,989,710	\$36,387,573	\$16,984,972
Allowance for Undefined scope	\$10,000,000	\$10,000,000	\$15,000,000	\$10,000,000	
Removal of Infrastructure (east of Wickham) and Redundant Corridor				\$0	\$9,463,574
A. Contractor's Direct Costs (Total)	\$73,958,196	\$73,216,205	\$92,295,834	\$88,667,363	\$83,489,465
Contractor's Design	18,489,549	18,304,051	23,073,959	22,166,841	8,414,952
Contractor's Management, O&M and Profit	25,885,369	25,625,672	32,303,542	31,033,577	38,409,580
B. Contractor's Indirect Costs (Total)	\$44,374,918	\$43,929,723	\$55,377,500	\$53,200,418	\$46,824,532
					\$140,323,997
Property Acquisition ¹	0	3,300,000	1,440,000	3,300,000	0
Possessions ²	8,500,000	8,500,000	8,500,000	8,500,000	8,507,000
TINSM Costs	18,933,298	18,743,348	23,627,734	22,698,845	31,572,899
Contingency / Risk Allowance ³	58,306,565	59,075,711	72,496,427	70,546,650	72,161,559
Escalation	16,325,838	16,541,199	20,299,000	19,733,062	41,332,337
Total Project Cost incl Overheads	\$220,400,000	\$223,510,000	\$274,040,000	\$266,670,000	\$293,900,000

Notes:

- The estimated cost associated with property acquisition varies depending on the option. For the truncation it has been assumed Wickham requires no property acquisition. The Hamilton option would require a portion of land to be acquired at the end of Railway Lane, which is on the northern side of the current alignment to allow the stabling facility to be constructed. The Broadmeadow option would require the acquisition of a strip of road reserve from Council to allow a new freight track to be built on the western side of the corridor. For the light rail property acquisition requirements vary with the options, however there is likely to be little to no outright property that needs to be purchased and is likely to be more about compensation to Council for shared use of their roads or other public space e.g. Hamilton Park which is between Donald St and the railway line at Hamilton.
- All of the truncation estimates include an allowance of \$8.5m for possession costs in line with usual practice of the rail operating branch charging the projects for their costs associated with possessions. This allowance is consistent with the amount allowed in the June 2013 Evans and Peck budget estimate. Once scope is fully developed and delivery methodology agreed, this figure will be reviewed.
- A 40% allowance for contingency and risk has been allowed in keeping with TPD practice for estimates at this stage of development. In addition, an allowance of 8% has been included for price escalation on the basis that construction would be carried out between 2015 to 2017.

ATTACHMENT C: Assessment Criteria

Assessment criteria have been established for the strategic merit assessment of the heavy rail terminus and light rail interchange location, and the alignment of light rail in the Newcastle city centre. The assessment criteria are aligned with the strategic goals of the Newcastle Light Rail Project, as follows:

Assessment Criteria: Heavy Rail Terminus and Light Rail Interchange

Strategic Objective	Criteria
Enabling Urban Revitalisation and Connecting the Foreshore with the City Centre	<ul style="list-style-type: none">• Land available for new development• Transit-oriented development potential
Supporting Future Strategic Planning	<ul style="list-style-type: none">• Alignment with the Newcastle Urban Renewal Strategy• Future proofing for extensions to the wider light rail network to the west
Maximising Customer Experience	<ul style="list-style-type: none">• Customer journey time including interchange requirements• Public transport integration between trains, light rail, buses and ferries• Impacts to customers during construction• Customer safety at stops and stations• Overall public transport patronage potential
Maximising Transport Network Efficiency	<ul style="list-style-type: none">• Traffic and bus network improvements with the removal of the railway level crossings• Bus network efficiency within the city centre• Impacts on freight rail operations• Operational efficiency for heavy rail stabling and maintenance facilities
Minimising Construction and Operational Costs	<ul style="list-style-type: none">• Indicative capital cost for the heavy rail terminus, light rail and bus interchange and light rail to Newcastle in the rail corridor• Property required outside of the railway corridor• Operating cost for train and light rail and bus services
Minimising Delivery Risk	<ul style="list-style-type: none">• Engineering constructability• Required planning and environmental approvals

Assessment Criteria: Light Rail Core Alignment in the CBD

Strategic Objective	Criteria
Enabling Urban Revitalisation and Connecting the City Centre with the foreshore	Ease of access between City Centre and the foreshore
	Placemaking opportunities along the light rail route
	Ability to consolidate development sites along the light rail route
	Likely increase in property values
Supporting Future Planning	Ease of connectivity for an extension to the east
Maximising Customer Experience	Alignment with the Newcastle Urban Renewal Strategy
	Patronage potential along the light rail route
	Customer journey time and reliability along the light rail route east of Wickham
	Light rail route legibility
Maximising Transport Network Efficiency	Impacts during construction
	Customer safety at, and walking to, light rail stops
	Level of disruption to the road network
	Loss of kerb space, loading access, car parking and taxis along the light rail route
	Light rail operations
Minimising Construction and Operational Costs	Indicative capital cost for the light rail between Wickham and Newcastle
	Property required outside of the railway corridor
	Operating cost for light rail in the city centre
Minimising Delivery Risk	Engineering constructability
	Required planning and environmental approvals

ATTACHMENT D: Heavy Rail Terminus and Light Rail Interchange Options

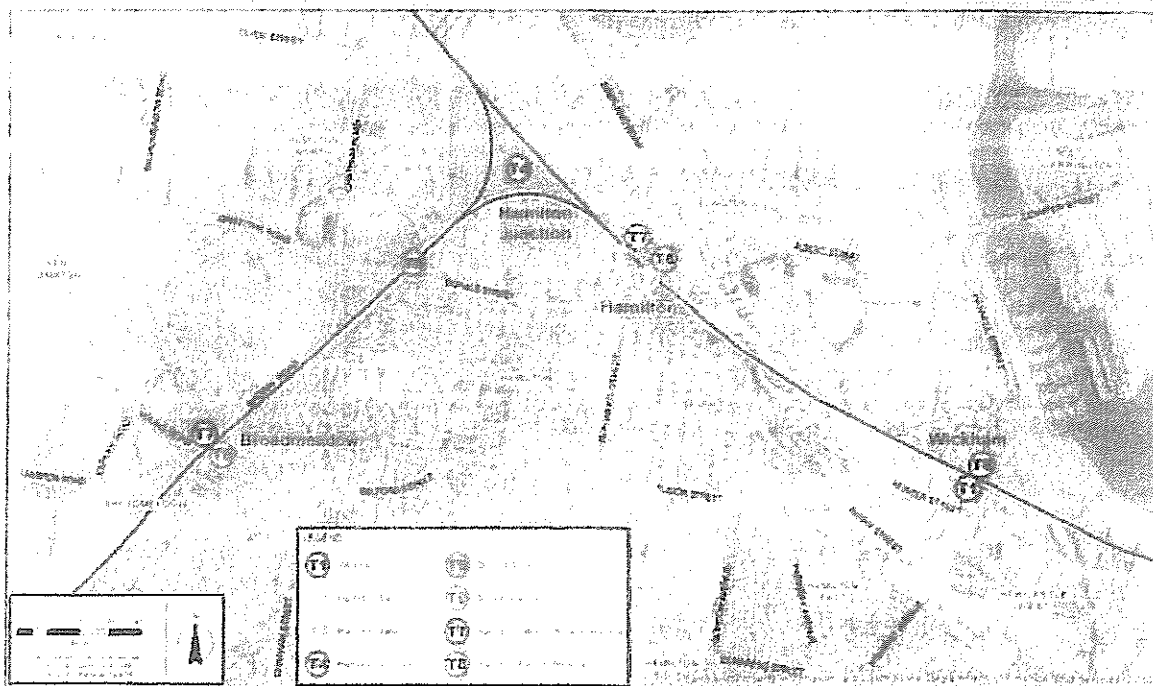
Existing Heavy Rail Corridor and Key Station Locations



Key station locations

- The diagram above shows the existing heavy rail corridor and the key station locations
- Broadmeadow, Hamilton, Woodville Junction (also known as Hamilton Junction) and Wickham have been much discussed as potential truncation / interchange locations in the media and submissions to Transport for NSW.

Heavy Rail Terminus / Light Rail Interchange Location Options



Heavy Rail Terminus / Light Rail Interchange Location Options

- Eight options have been identified as potential locations for the truncation of the heavy rail line into Newcastle and the construction of an interchange between heavy rail and the new light rail system.
- Options are focussed around the key locations of Wickham, Hamilton, Hamilton Junction and Broadmeadow.
- Operational requirements include:
 - the ability to cater to diesel trains from north, and electric trains from Sydney;
 - the ability to interchange between heavy and light rail services;
 - capacity to deliver appropriate train stabling at a suitable location;
 - capacity to deliver maintenance and staff facilities;
 - minimal impact on north/south freight trains; and
 - space to provide bus interchange and kiss and ride and taxi facilities.

Options are:

- T1 Wickham, west of Stewart Avenue
- T2 Hamilton East of Beaumont Street
- T3 Hamilton West of Beaumont Street
- T4 Hamilton Junction (The Triangle)
- T5 Donald Street
- T6 Broadmeadow
- T7 Broadmeadow and Hamilton West
- T8 Wickham and Hamilton East

Option T1 Terminus at Wickham west of Stewart Avenue



Features:

- Terminate light rail west of Stewart Avenue within the railway corridor
- New platforms required for terminating electric and diesel trains
- Train stabling needed west of station, east of Beaumont Street
- Two level crossings removed from the city centre, Railway Street level crossing closed to traffic, Beaumont Street level crossing remains in place.

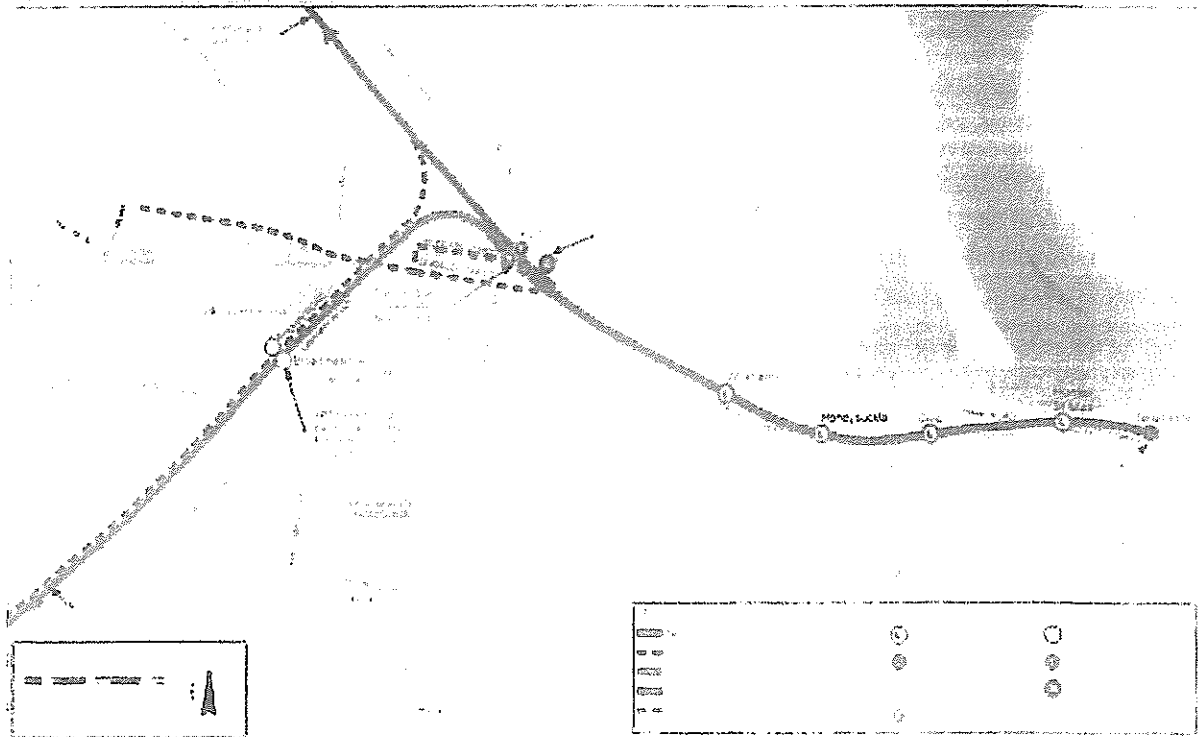
Advantages:

- Creates a gateway to the new CBD of Newcastle
- Best opportunity for a TOD with the most developable land in the proximity of the station, and lowest levels of mine subsidence in the area
- Provides 675,000 m² gross floor area and 11.5 ha of unfragmented land for development at the site of the new CBD
- 2 train controlled level crossings removed
- Walkable catchment to area zoned for high density development
- Short light rail system east of Wickham with low capital cost
- Transfer to light rail direct to CBD for both Hunter Line and Sydney/Central Coast passengers
- Beaumont Street level crossing remains open but train crossing numbers are reduced, as stabling and shunting occurs east of Beaumont Street

Disadvantages

- Level crossing remains at Beaumont Street
- Railway Street level crossing may be retained, or Railway Street may be closed (subject to further investigation)
- More costly for Wider Light Rail network expansion to the west
- Transfer required for short distance between Wickham and Newcastle stations
- Need to purchase properties outside railway corridor for bus interchange
- Shortest light rail solution at 2.3km
- Flood risk being closer to Cottage Creek and the Throsby Basin foreshore

Option T2 Terminus at Hamilton east of Beaumont Street



Features:

- Terminate light rail east of Beaumont Street within the railway corridor
- Reuse platforms required for terminating electric and diesel trains
- Train stabling between existing station and Maitland Road overpass
- 3 train controlled level crossings removed, Beaumont Street level crossing remains open

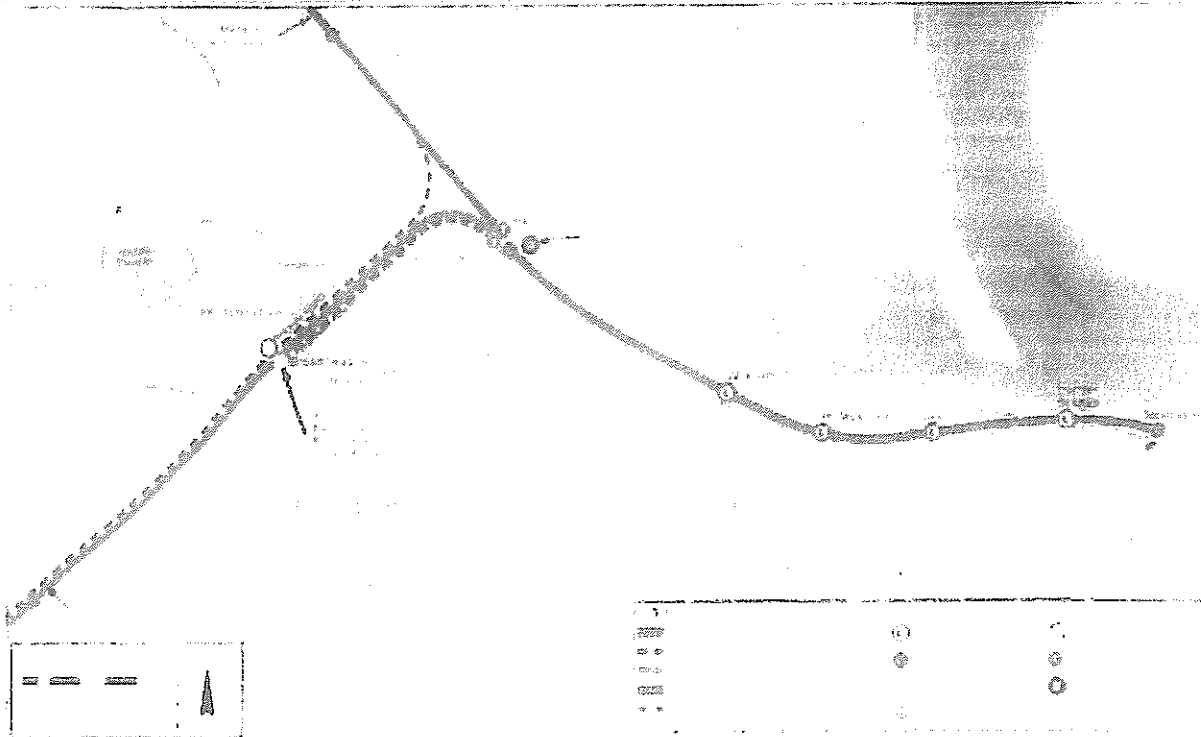
Advantages:

- Walkable catchment to area zoned for mixed use developments
- Residential catchment around Hamilton
- Available land for stabling east of station
- Maintenance facilities and potential light rail depot at Swan Street
- Transfer to light rail direct to CBD for both Hunter Line and Sydney/Central Coast passengers
- Potential western extension to Hunter Stadium and the Newcastle Showground via Hudson Street or Donald Street
- Train movements at Beaumont Street level crossing are reduced with stabling located to the east of the station.

Disadvantages

- Limited redevelopment opportunity with low density development in Beaumont Street
- Intensification limited by Floor Space Ratio and Building Height limits
- No major destinations in the vicinity
- May promote Beaumont Street precinct over the urban renewal along Hunter Street
- Not convenient to the bus routes in Maitland Road
- Lower interchange redevelopment opportunity with low density development in Beaumont Street
- Beaumont Street level crossing remains open.

Option T3 Terminus at Hamilton west of Beaumont Street



Features:

- Terminate light rail west of Beaumont Street within the railway corridor
- New platforms required for terminating electric and diesel trains
- Train and light rail stabling and maintenance at Swan Street facility
- 4 train-controlled level crossings removed from Newcastle

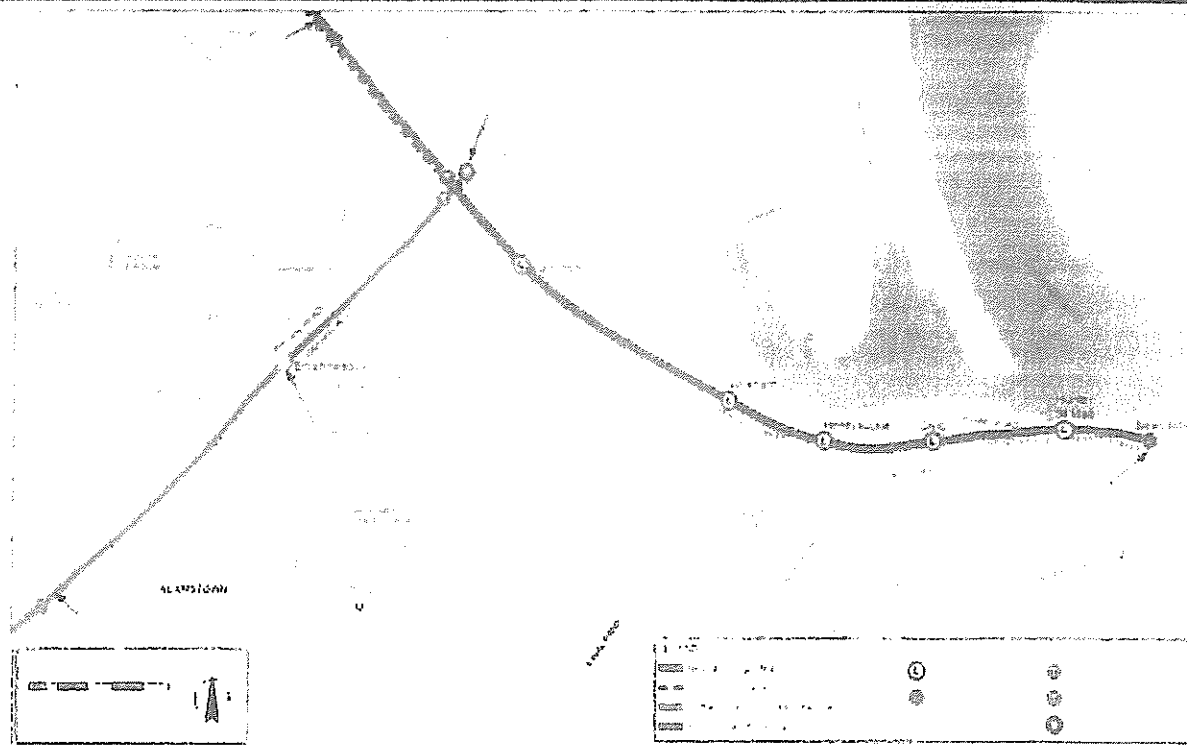
Advantages:

- Walkable catchment to area zoned for mixed use developments
- Available land for stabling and other facilities at Swan Street
- Transfer to light rail direct to CBD for both Hunter Line and Sydney/Central Coast passengers
- Four train controlled level crossings would be removed at Beaumont Street, Railway Street, Stewart Avenue and Merewether Street

Disadvantages

- May promote Beaumont Street precinct over the urban renewal along Hunter Street
- Insufficient land within the railway corridor and impact on rail junction
- Severe space limitations for platforms and new tracks with the close proximity to the track junction
- Heritage station box on the west side of Beaumont Street
- Not convenient to the bus routes in Maitland Road
- Limited redevelopment opportunity with low density development in Beaumont Street
- Limited opportunity for Wider Light Rail network expansion to the west

Option T4 Terminus at Hamilton Junction (The Triangle)



Features:

- New platforms required for terminating electric and diesel trains, and light rail line from Newcastle along railway corridor
- Light rail stabling and maintenance at Swan Street facility

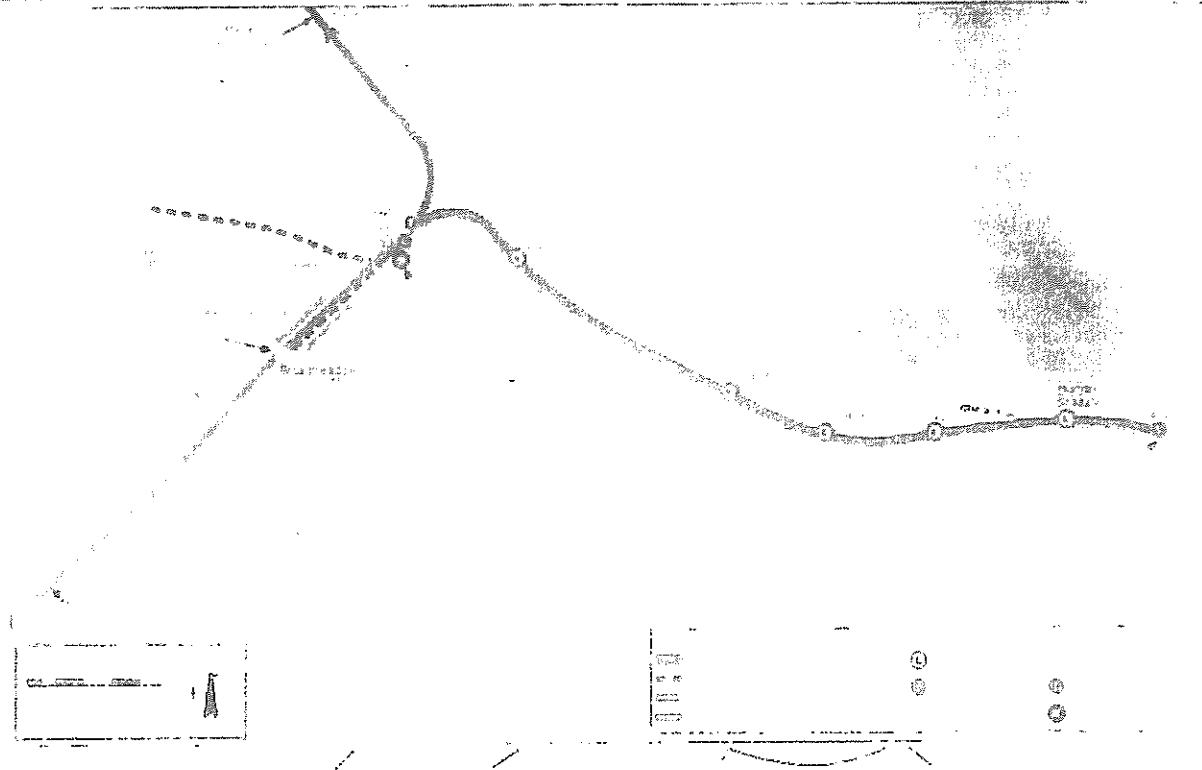
Advantages:

- Large area of under-utilised State-owned land
- Off-line construction
- Potential co-location with bus interchange and depot, and park & ride
- Light rail could be extended north along rail corridor
- 4 train-controlled level crossings removed from Newcastle
- Transfer to light rail direct to CBD for both Hunter Line and Sydney/Central Coast passengers

Disadvantages

- Greenfield site with no existing facilities or amenities, not a destination in its own right
- Limited walkable catchment
- Reduces options for extending Maitland services towards Central Coast
- No possibility to through-route trains from Maitland towards Sydney
- Bus routes require diversion to access the station from Maitland Road
- Relatively isolated location with implications for customer perception of safety
- No existing connections to road network so upgrades will be required
- Freight tracks may be affected with track alignment into the triangle
- Impacts on freight line during construction

Option T5 Terminus at Donald Street



Features:

- Terminate light rail north of Donald Street within the railway corridor
- New platforms required for terminating electric and diesel trains
- Train and light rail stabling and maintenance at Swan Street facility and Hamilton Junction

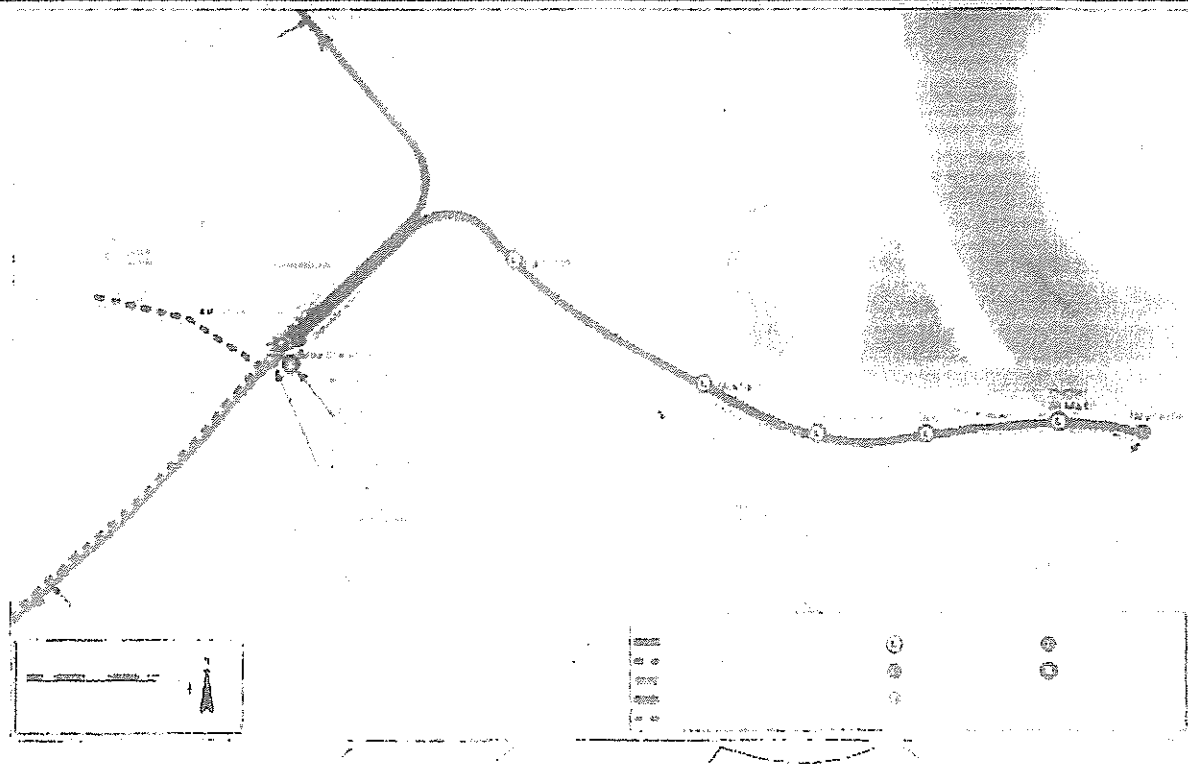
Advantages:

- 4 train-controlled level crossings removed from Newcastle
- Trains from Maitland are more conveniently located for light rail transfers
- Electric trains can stable on new tracks north of Woodville Junction
- The bus / rail interchange would be north of Donald Street with direct access for buses with the city centre and western suburbs

Disadvantages

- Surrounding area not currently zoned for high density development
- Surrounded by fragmented land ownership
- Not close to existing bus routes for good transport integration
- Passengers would require lifts and bridge to transfer between light and heavy rail services
- Customer amenity on platforms is poor with proximity to freight train operations
- Freight tracks may need to be shifted west
- Impacts on freight line during construction
- Hunter Line passengers deviate from the most direct access to the city centre
- Future Western extension would require crossing of freight rail line

Option T6 Terminus at Broadmeadow



Features:

- Terminate light rail on east side of Broadmeadow north of existing station
- Bus interchange can be built within Graham Road with roundabout
- Train stabling at Woodville Junction; tram depot at Swan Street facility
- 4 train-controlled level crossings removed from Newcastle

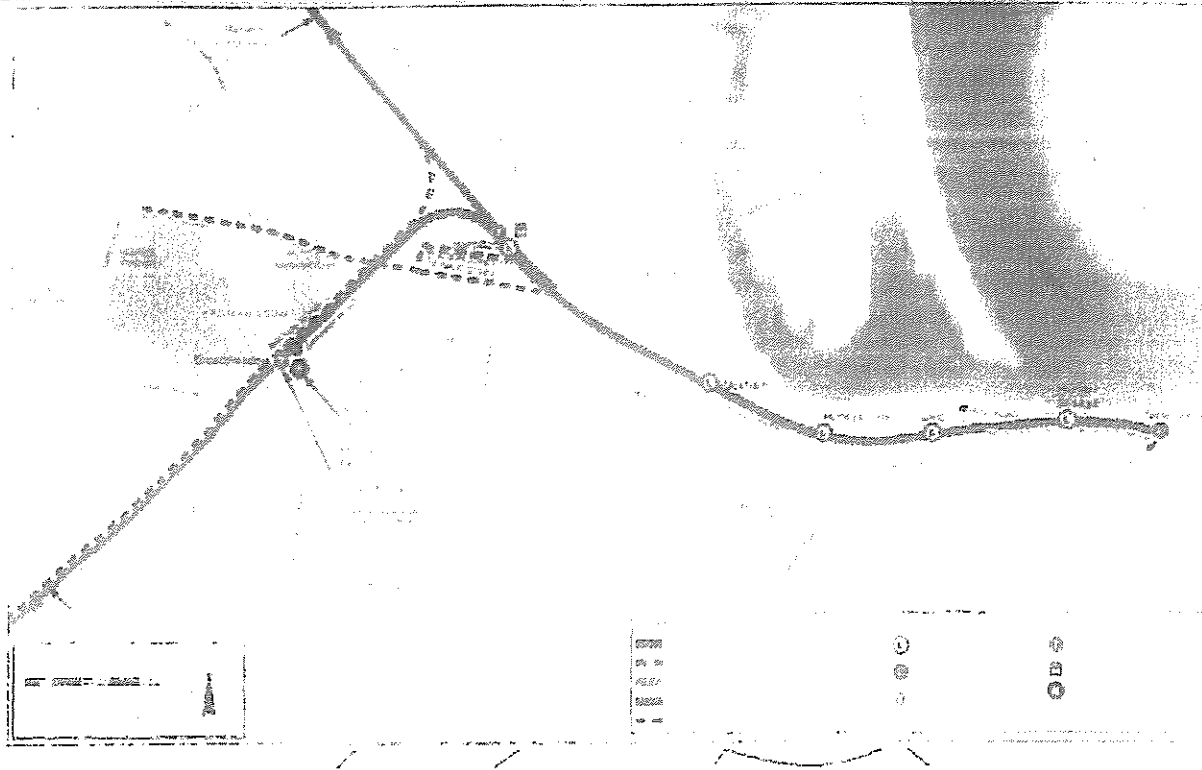
Advantages:

- Proximity to major destinations in the entertainment precinct
- Light rail infrastructure within the railway corridor (no land resumption)
- Re-use of existing Broadmeadow station platforms and other infrastructure
- Good location to integrate with Tudor Street high frequency bus corridor
- Allows for potential of future through-routing of Maitland trains to Morisset for enhanced heavy rail local service

Disadvantages

- Surrounded by fragmented land ownership
- Low-density residential area reduces potential for redevelopment and increases potential for amenity impacts
- Longer route for light rail infrastructure and travel time to Newcastle
- Does not follow most direct path to Newcastle city centre
- Hunter Line passengers are required to deviate to Broadmeadow before returning to access the city centre
- New stabling facilities required north of Woodville Junction
- Freight tracks may need to be shifted west
- Impacts on freight line during construction
- Severe operational difficulty implementing interim arrangements for trains and buses during construction.

Option T7 Terminus at Broadmeadow and Hamilton West



Features:

- Diesel trains terminate at Hamilton west; electric trains at Broadmeadow
- Terminate light rail on east side of Broadmeadow north of existing station
- Bus interchange can be built within Graham Road with roundabout
- Train stabling at Woodville Junction; tram depot at Swan Street facility
- 3 train-controlled level crossings removed

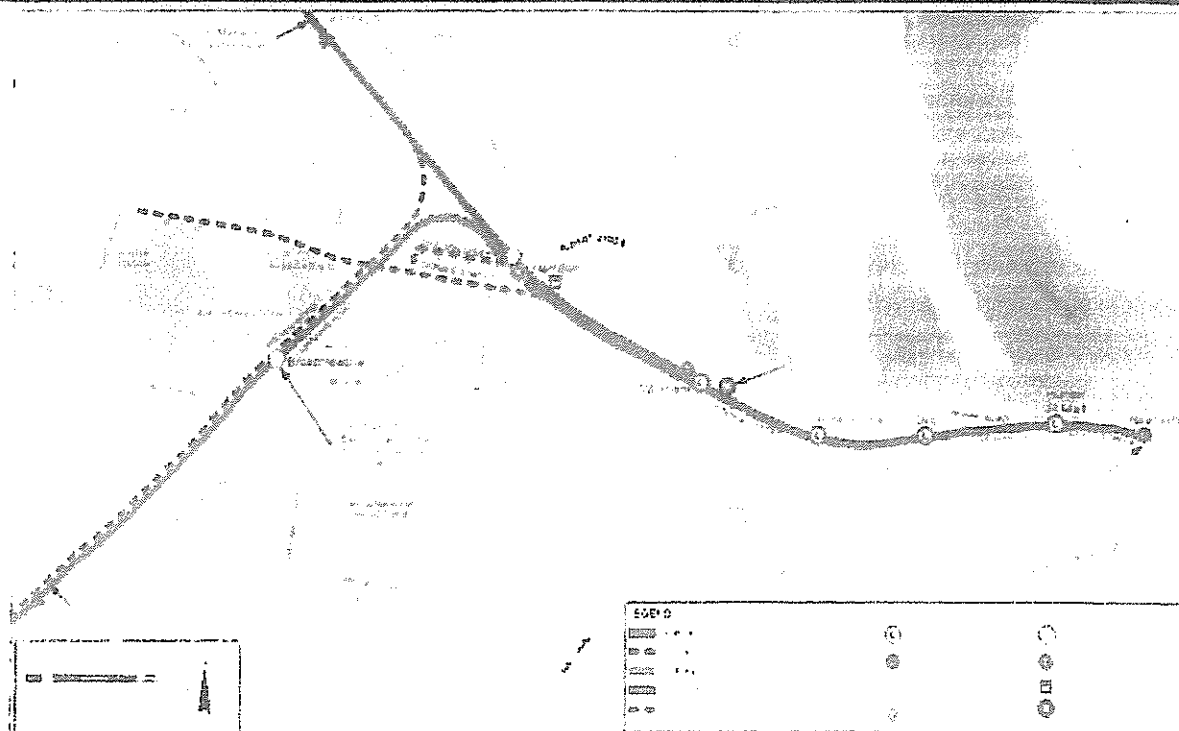
Advantages:

- Light rail infrastructure within the railway corridor (no land resumption)
- Re-use of existing platforms at Broadmeadow and Hamilton
- Hunter Line passengers are not required to travel to Broadmeadow for transfer
- Proximity of Broadmeadow to major destinations in the entertainment precinct
- Broadmeadow is close to Hunter Stadium and the Entertainment Centre precinct
- Hamilton is close to Beaumont Street activity centre
- Residential catchment around station on the eastside of the railway line at Broadmeadow
- Re-use of existing platforms at Broadmeadow and Hamilton stations

Disadvantages

- Diesel and electric trains do not connect for customers to change trains
- Insufficient space for bus interchange at Broadmeadow or Hamilton
- New stabling facilities required north of Woodville Junction
- Freight tracks may need to be shifted west
- Impacts on freight line during construction
- Longer route for light rail infrastructure and travel time to Newcastle with higher infrastructure and operational cost
- Restricted width of site within the railway corridor may require more land to accommodate terminus platforms

Option T8 Terminus at Wickham and Hamilton East



Features:

- Diesel trains terminate at Wickham with light rail on shared platform
- Electric trains terminate east of Beaumont Street with stabling east of station near Maitland Road bridge
- 2 train-controlled level crossings removed

Advantages:

- Diesel trains from Maitland terminate closer to city centre and new CBD
- Light rail infrastructure within the railway corridor (no land resumption)
- Options for extension of light rail west to Hunter Stadium via Hudson St
- Re-use of existing Hamilton station platforms and other infrastructure
- Wickham is a good location for bus and coach terminus/layover area
- Transfer to light rail direct to CBD for both Hunter Line and Sydney/Central Coast passengers
- Proximity to major destinations in the entertainment precinct
- Potential for stabling on the north side of the railway corridor between a new Hamilton station and the Maitland Road overpass

Disadvantages

- Poorer customer legibility with two stations for diesel and electric trains to terminate; however, Hamilton would be the train transfer station
- Duplication of light rail and heavy rail between Hamilton and Wickham
- Level crossings not removed at Railway Street and Beaumont Street
- Low-density residential area reduces potential for redevelopment and increases potential for amenity impacts
- Light Rail extension must cross freight and other heavy rail line to access Hunter Stadium and the Newcastle Showgrounds and Entertainment Centre.

ATTACHMENT E: Heavy Rail Terminus and Light Rail Interchange Assessment

Heavy Rail Terminus and Light Rail Interchange Location – Long List – Strategic Assessment							
Option Description	Enabling Urban Revitalisation	Maximising Customer Experience	Maximising Transport Network Efficiency	Minimising construction and Operational Costs	Minimising Delivery Risk	Supporting Future Planning	Short List
T1 Wickham west of Stewart Avenue	●	●	●	●	●	●	●
T2 Hamilton east of Beaumont Street	●	●	●	●	●	●	●
T3 Hamilton west of Beaumont Street	●	●	●	●	●	●	●
T4 Hamilton Junction ("The Triangle")	●	●	●	●	●	●	●
T5 North of Donald Street	●	●	●	●	●	●	●
T6 Broadmeadow	●	●	●	●	●	●	●
T7 Broadmeadow and Hamilton west of Beaumont Street	●	●	●	●	●	●	●
T8 Wickham and Hamilton east	●	●	●	●	●	●	●

Legend:

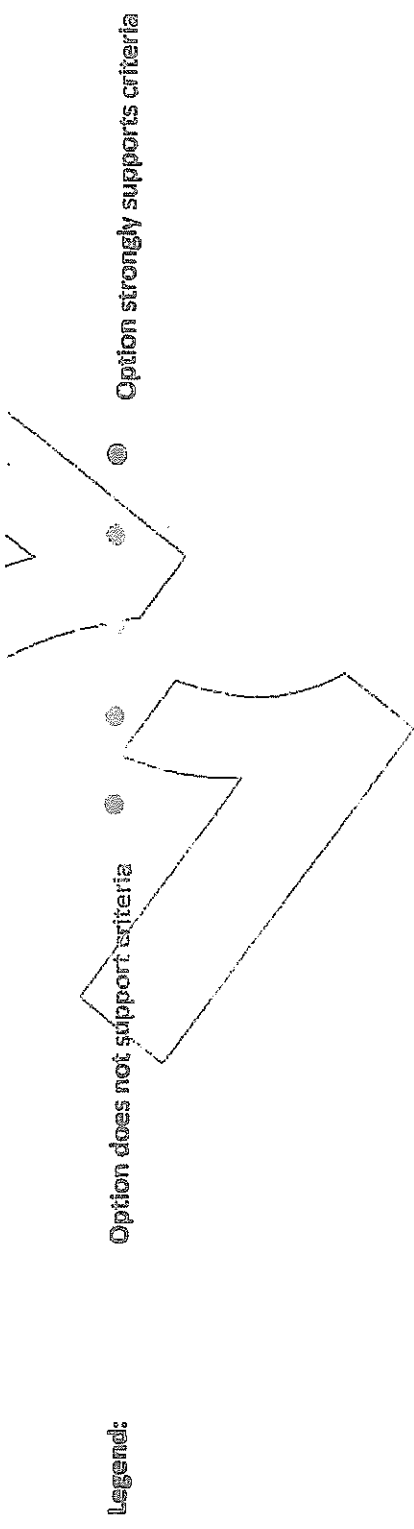
● Option does not support criteria

● Option strongly supports criteria

CONFIDENTIAL

Heavy Rail Terminus and Light Rail Interchange Location – Short List – Multi-criteria Assessment							
Option Description	Enabling Urban Revitalisation	Maximising Customer Experience	Maximising Transport Network Efficiency	Minimising Construction and Operational Costs	Minimising Delivery Risk	Supporting Future Planning	Ranking

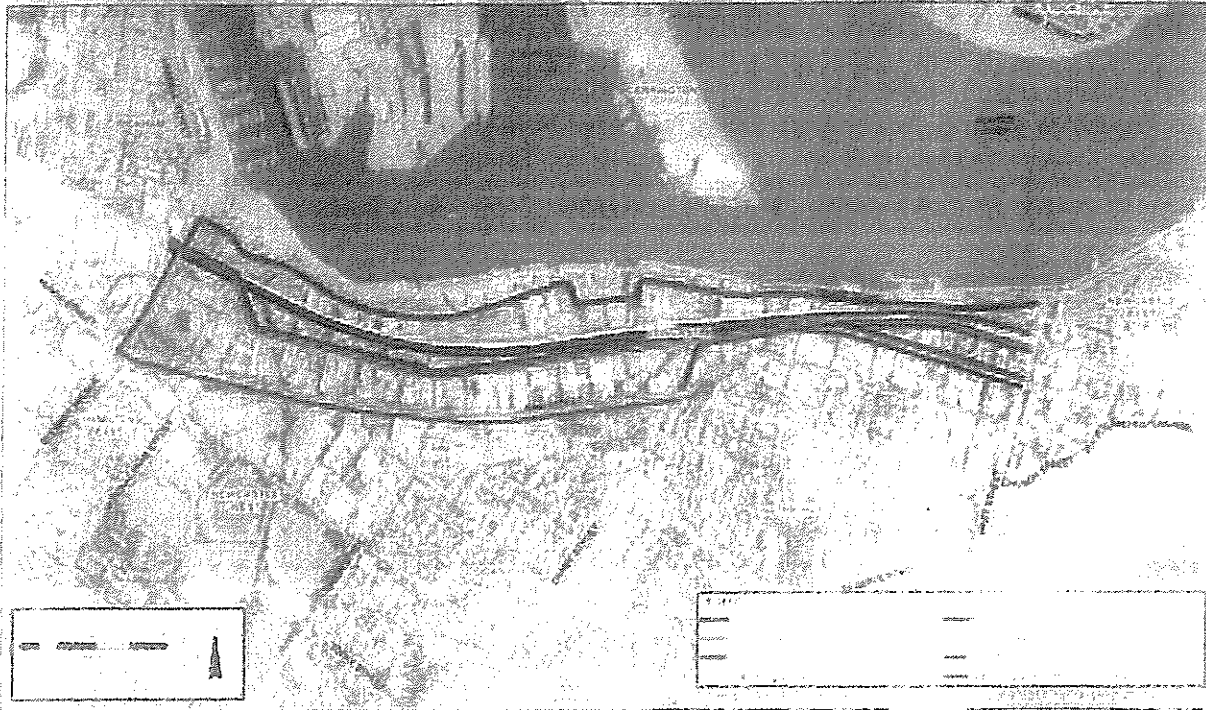
T1 Wickham west of Stewart Avenue	●	●	●	●	●	●	1
T2 Hamilton east of Beaumont Street	●	●	●	●	●	●	3
T6 Broadmeadow	●	●	●	●	●	●	4
T8 Wickham and Hamilton east	●	●	●	●	●	●	2



1000 1000 1000 1000 1000

Tab F: Light Rail Route Alignment Options

Core Light Rail Route Options



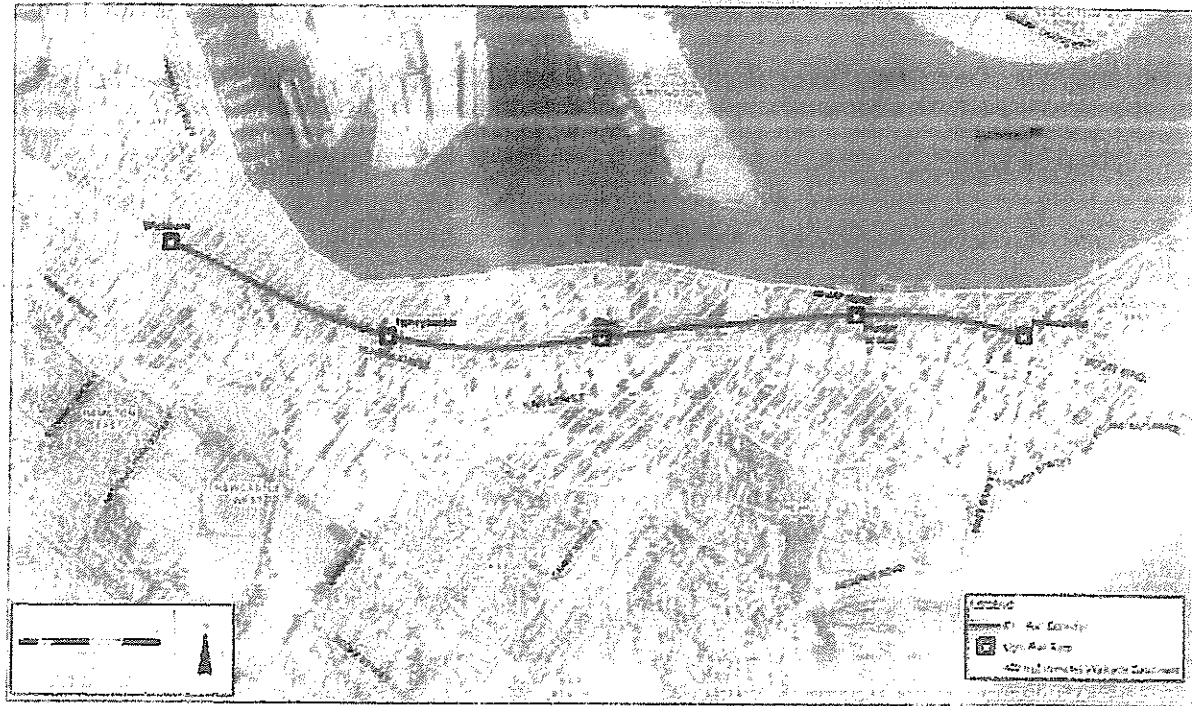
Core Light Rail Route Alignment Options

- 8 options have been identified for the alignment of the core light rail route through the city centre.
- Public debate has focussed on the location of light rail in the existing rail corridor, or along Hunter Street.
- Three options for extending light rail to the east of the city centre towards the beach have been identified, and will be assessed when a preferred alignment is established.
- Three options have also been identified to connect light rail to a western heavy rail terminus and light rail interchange. These will be assessed when a preferred terminus location is established.

Options are:

- C1 Rail corridor
- C2 Hunter Street and Scott Street
- C3 Hunter Street and Hunter Street Mall
- C4 King Street
- C5 Honeysuckle Drive and Wharf Road
- C6 Railway Corridor and Scott Street
- C7 Railway Corridor and Hunter Street Mall
- C8 King Street, Hunter Street and Scott Street

Option C1 Railway Corridor



Features:

- Use existing heavy rail corridor to Watt Street
- New stations at Honeysuckle and Hunter Street Mall
- 2.4 km with average stop spacing of 600 m

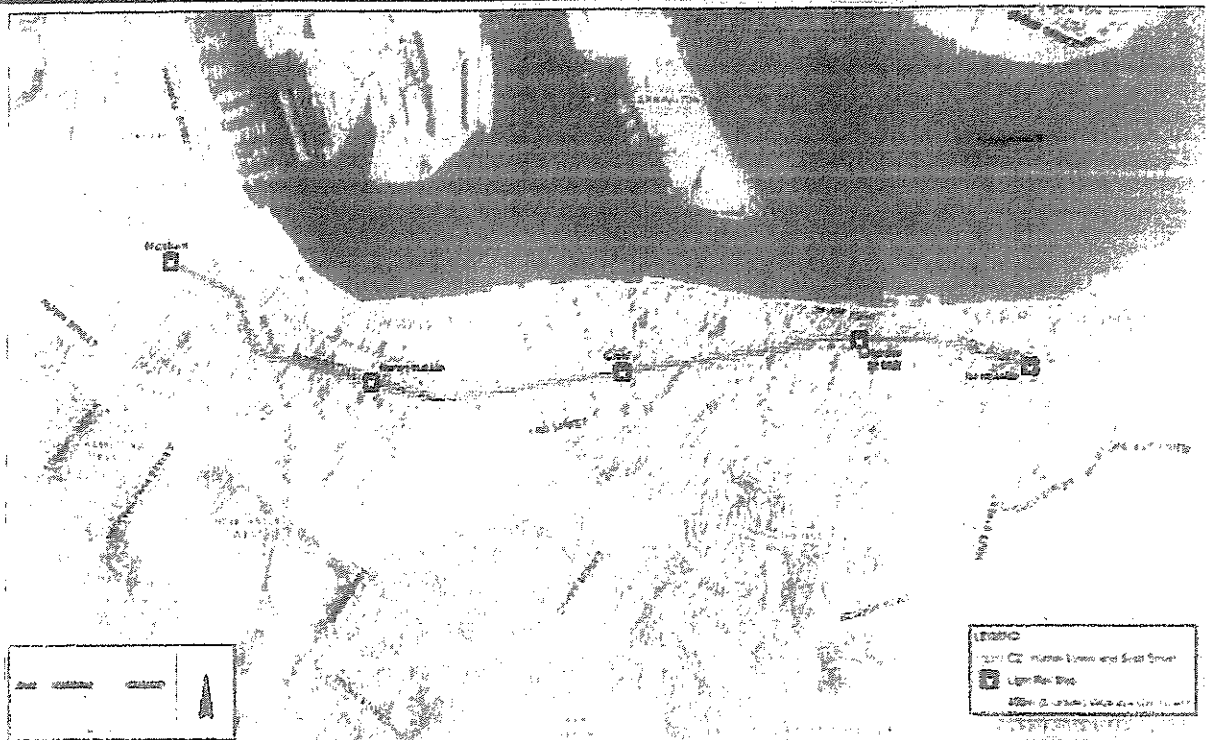
Advantages:

- Reuse existing track base in corridor
- No services to be relocated in rail corridor
- Minimal disruption to traffic in other streets during construction
- Development on both sides at Civic, Honeysuckle & Wickham Stations
- Easy connection to Queens Wharf ferry terminal across Wharf Road

Disadvantages

- Train services discontinued during construction
- Existing development along rail corridor does not open onto the corridor
- Eastern extension beyond Newcastle Station would require turns to avoid Customs House

Option C2 Hunter Street and Scott Street



Features:

- Use Hunter Street via Bellevue Street from Wickham station
- New stations at Honeysuckle and Hunter Street Mail
- 2.5 km with average stop spacing of 630 m

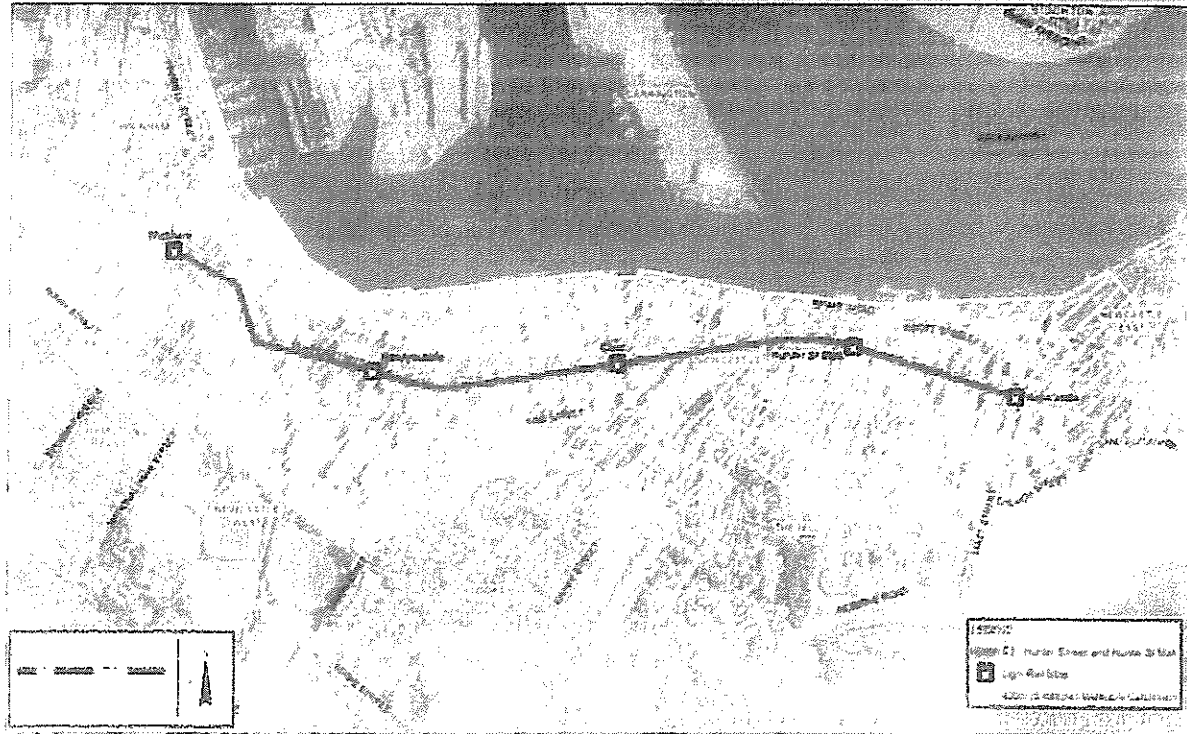
Advantages:

- Development on both sides at Civic, Honeysuckle & Wickham stations
- Light rail travels directly in the Hunter Street renewal area
- Possible extension to Newcastle Beach via Scott Street
- Heavy rail services into CBD could be maintained during most of construction period
- Connection to Queens Wharf ferry terminal from Scott Street

Disadvantages

- Disruption to traffic and buses in Hunter Street during construction
- Cost for relocating underground services in Hunter Street
- Slower operations with on-street running of light rail
- Cost for treatment of redundant rail corridor

Option C3 Hunter Street and Hunter Street Mall



Features:

- Use Hunter Street via Bellevue Street from Wickham station
- New stations at Honeysuckle and Hunter Street Mall
- 2.5 km with average stop spacing of 640 m

Advantages:

- Development on both sides at Civic, Honeysuckle & Wickham stations
- Light rail travels directly in the Hunter Street renewal area
- Train services can be maintained during most of construction period
- Connection to Queens Wharf ferry terminal via Wolfe Street

Disadvantages

- Disruption to traffic and buses in Hunter Street during construction
- Limited width for light rail in Hunter Street Mall
- East end of Hunter Street is currently one-way westbound to Perkins St
- Cost for relocating underground services in Hunter Street
- Slower operations with on-street running of light rail
- Extension to beach would turn into Watt Street or end at Pacific Park
- Cost for treatment of redundant rail corridor

Option C4 King Street



Features:

- Use of King Street from Stewart Avenue to Watt Street
- New stations at Marketown and Wolfe Street (Hunter Street Mall)
- 2.8 km with average stop spacing of 710 m

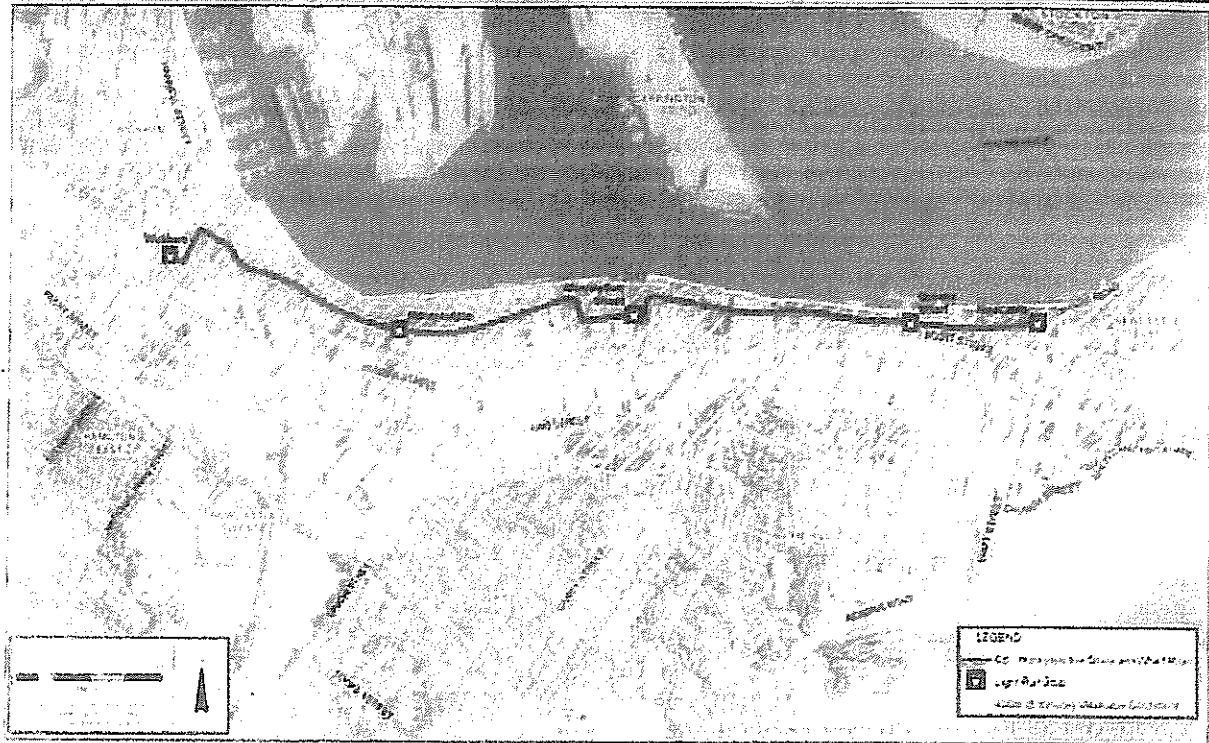
Advantages:

- Stops at Marketown for shopping and Civic Park at cultural venues
- Closer to Darby Street café precinct
- Train services can be maintained during construction

Disadvantages

- King Street is not central to potential redevelopment area
- Eastern end of King Street is too steep for light rail operations
- Western end of King Street has flood risk from Cottage Creek
- Extension to beach would need to turn into Watt Street
- Use of Stewart Avenue creates traffic conflicts
- Longer travel time to Wickham; not close to Queens Wharf ferry terminal
- Disruption to traffic and buses during construction
- Cost for treatment of redundant rail corridor

Option C5 Honeysuckle Drive and Wharf Road



Features:

- Use of existing roads through Honeysuckle Precinct and along foreshore
- New stations at Honeysuckle and Queens Wharf
- 2.6 km with average stop spacing of 640 m

Advantages:

- Closest to Honeysuckle precinct and Newcastle Museum
- Development on both sides at Civic, Honeysuckle & Wickham stations
- Train services can be maintained during construction
- Convenient to Queens Wharf ferry terminal in Wharf Road

Disadvantages

- Walkable catchment is away from the City Centre
- 5 turns slow down operations; traffic impacts with use of Stewart Ave
- Potential conflicts with high pedestrian activity areas, such as Museum
- Limited potential for new development along the corridor
- Underground service relocations in Honeysuckle Drive/Wharf Road
- Cost for treatment of redundant rail corridor

Option C6 Railway Corridor and Scott Street



Features:

- Use existing heavy rail corridor
- New stations at Honeysuckle and Hunter Street Mall
- 2.4 km with average stop spacing of 610 m

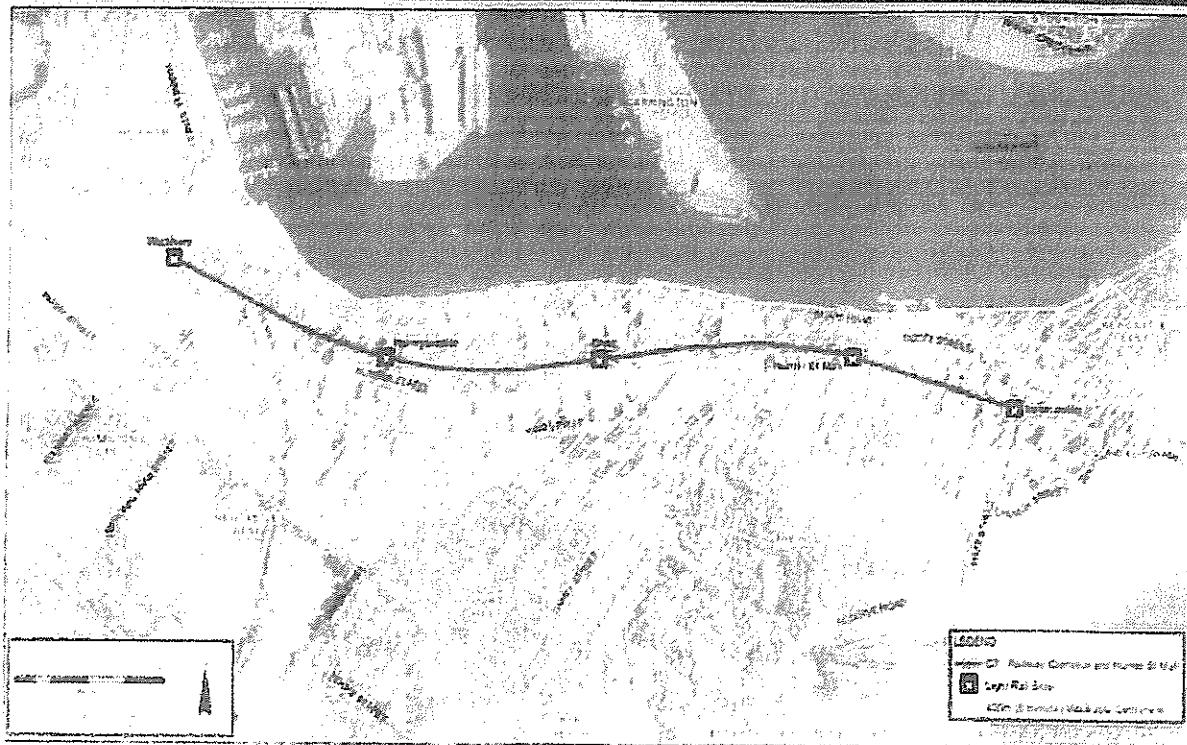
Advantages:

- Reuse existing track base in corridor for faster, less costly construction
- No services to be relocated in rail corridor
- Minimal disruption to traffic in other streets during construction
- Development on both sides at Civic, Honeysuckle & Wickham stations
- Connection to Queens Wharf ferry terminal from Scott Street

Disadvantages

- Train services discontinued during construction
- Existing development along rail corridor has rear building entrances
- Lower potential for urban renewal in the City Centre
- Merewether Street and Stewart Avenue would have 2 crossings close by

Option C7 Railway Corridor and Hunter Street Mall



Features:

- Use existing heavy rail corridor and Hunter Street Mall
- New stations at Honeysuckle and Hunter Street Mall
- 2.4 km with average stop spacing of 600 m

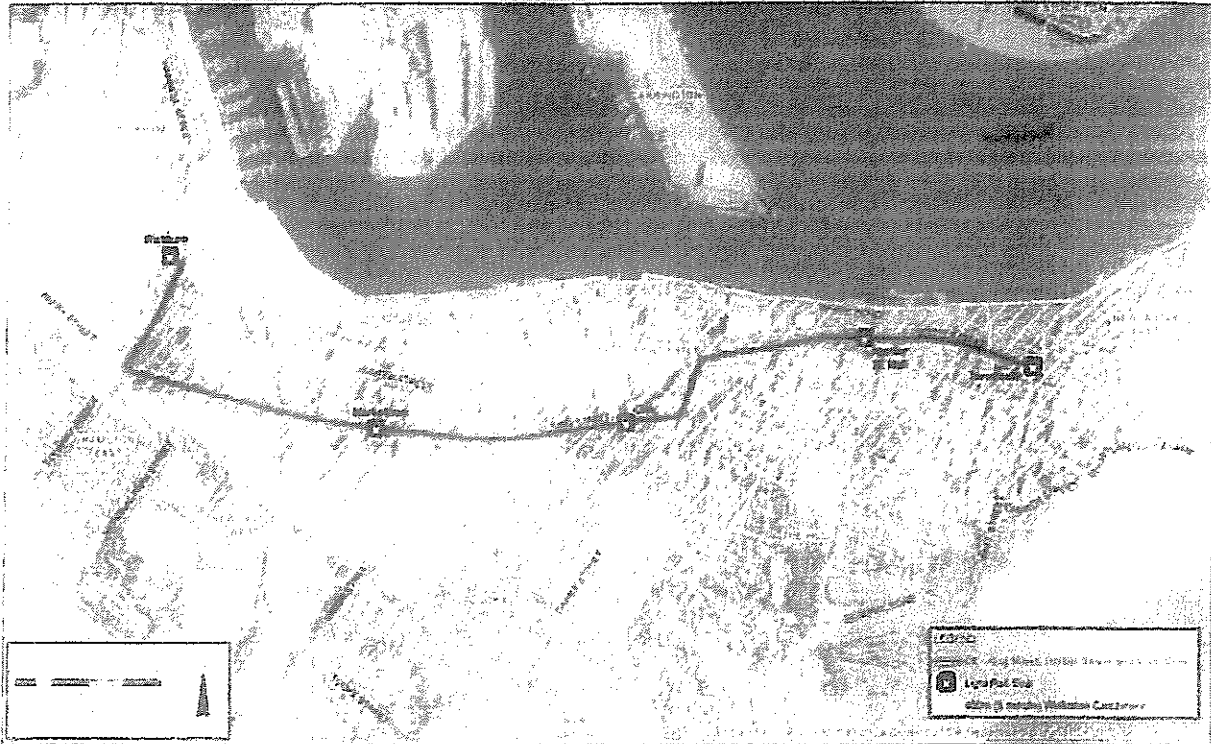
Advantages:

- Reuse existing track base in corridor for faster, less costly construction
- No services to be relocated in rail corridor
- Minimal disruption to traffic in other streets during construction
- Development on both sides at Civic, Honeysuckle & Wickham stations
- Connection to Queens Wharf ferry terminal via Wolfe Street

Disadvantages

- Train services discontinued during construction
- Existing development along rail corridor does not open onto the corridor
- Impact on street amenity in Hunter Street Mall with narrow width
- Merewether Street and Stewart Avenue would have 2 crossings close by

Option C8 King Street to Hunter and Scott Streets



Features:

- Connects Wickham to Markettown and Civic Park via King Street
- New stations at Markettown and Hunter Street Mall
- 2.9 km with average stop spacing of 740 m

Advantages:

- Stops at Markettown for shopping and Civic Park at cultural venues
- Uses widest and flattest end of King Street
- Closer to Darby Street café precinct at Civic
- Connection to Queens Wharf ferry terminal from Scott Street
- Possible extension to Newcastle Beach via Scott Street

Disadvantages

- King Street is not central to potential redevelopment area
- Does not provide for urban renewal opportunities along Hunter Street
- 3 turns along longest route for slower light rail operations
- Use of Stewart Avenue creates traffic conflicts
- Disruption to traffic and buses during construction
- Cost for treatment of redundant rail corridor

ATTACHMENT G: Light Rail Route Alignment Options Assessment

Core Light Rail Route – East of Stewart Avenue – Strategic Assessment Results							
Option Description	Enabling Urban Revitalisation and Connecting City Centre to Foreshore	Maximising Customer Experience	Maximising Transport Network Efficiency	Minimising Construction and Operational Costs	Minimising Delivery Risk	Supporting Future Planning	Short List
C1 Railway corridor	●	●	●	●	●	●	✓
C2 Hunter Street and Scott Street	●	●	●	●	●	●	✓
C3 Hunter Street and Hunter Street Mall	●	●	●	●	●	●	✓
C4 King Street	●	●	●	●	●	●	✗
C5 Honeysuckle Drive and Wharf Road	●	●	●	●	●	●	✗
C6 Railway corridor and Scott Street	●	●	●	●	●	●	✓
C7 Railway corridor and Hunter Street Mall	●	●	●	●	●	●	✓
C8 King Street, Hunter Street and Scott Street	●	●	●	●	●	●	✗

Legend:

● Option does not support criteria

● Option strongly supports criteria

CONFIDENTIAL - PUBLIC

Core Light Rail Route—East of Stewart Avenue – Multi Criteria Analysis Results

Option Description	Enabling Urban Revitalisation and Connecting City Centre to Foreshore	Maximising Customer Experience	Maximising Transport Network Efficiency	Minimising Construction and Operational Costs	Minimising Delivery Risk	Supporting Future Planning	Rank
C1 Railway corridor			●	●	●	●	2
C2 Hunter Street and Scott Street	●	●	●	●	●	●	4
C3 Hunter Street and Hunter Street Mall	●	●	●	●	●	●	5
C5 Railway corridor and Scott Street	●	●	●	●	●	●	1
C7 Railway corridor and Hunter Street Mall	●	●	●	●	●	●	3

Legend:

Option does not support criteria

Option strongly supports criteria

SECRET

Cor



Light Rail Beach Alignment Options Assessment						
Option Description	Enabling Urban Revitalisation and Connecting City Centre to foreshore	Maximising Customer Experience	Maximising Transport Network Efficiency	Minimising Construction and Operational Costs	Minimising Delivery Risk	Supporting Future Planning
01 Nobbys Beach via Wharf Road	●	●	●	●	●	●
02 Nobbys Beach via Parnell Place	●	●	●	●	●	●
03 Newcastle Beach at Zaara Street	●	●	●	●	●	●
04 Newcastle Beach at Telford Street	●	●	●	●	●	●
05 Pacific Park from Hunter Street	●	●	●	●	●	●

Legend:

● Option not support criteria

● Option strongly supports criteria

Light Rail Beach Alignment Options Assessment						
Option Description	Enabling Urban Revitalisation and Connecting City Centre to Foreshore	Maximising Customer Experience	Maximising Transport Network Efficiency	Minimising Construction and Operational Costs	Minimising Delivery Risk	Supporting Future Planning
B1 Nobbys Beach via Wharf Road	●	●	●	●	●	●
B2 Nobbys Beach via Parnell Place	●	●	●	●	●	●
B3 Newcastle Beach at Zaara Street	●	●	●	●	●	●
B4 Newcastle Beach at Telford Street	●	●	●	●	●	●
B5 Pacific Park from Hunter Street	●	●	●	●	●	●

Legend: ● Option does not support criteria ● Option strongly supports criteria

re/cor

